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CONTENTS OF VOLUME 41

ORIGINAL CONTRIBUTIONS, REPORTS, GENERAL REVIEWS, SUMMARIES, DISCUSSIONS

Freedom and constraint or potentiality and environment: John E. Anderson 1
Schilder's mind: perception and thought and goals and desires of man: Robert P. Fischer 30
A note on the age-placement of Binet tests: Nathan Jaspen ... 41
Chart of the proposed APA reorganization: Willard L. Valentine & John E. Anderson 43

Psychology and the war:

Occupational and vocational rehabilitation: Richard M. Elliott 47
The central examining board for the training of Naval air cadets: Ellis Weitzman & Ralph C. Bedell 57
The relation of personal data to achievement in a radio training school: John M. Hadley 60
Psychology in Cuba: W. H. D. Vernon 73
Psychological effects of the menstrual cycle on women workers: Georgene H. Seward 90

Psychology and the war:

History, organization and procedures, psychological research unit no. 1, Army air forces: Staff, PRU No. 1 103
Social psychologists in the national war agencies: Donald G. Marquis 115
Factors related to vocational interests: Ralph F. Berdie 137
On "The analysis of variance in psychological research": David A. Grant 158

Psychology and the war:

Placement testing of the civilian personnel in the air service command: Roger T. Lennon 167
The personnel consultant in an Army training center: G. M. Gilbert 180
The work of psychologists in the ninth service command special training center: Hugh M. Bell & William D. Altus 187
A modern account of problem solving: Donald M. Johnson 201
A note on the proposed By-Laws of the APA: Edward E. Anderson 230
A note on the meeting of the Joint Constitutional Committee of the APA and AAAP: John E. Anderson 235

Psychology and the war:
Organization and research activities, psychological research unit no. 3, Army air forces: STAFF, PRU NO. 3........ 237
Office of the Psychological Personnel. Report for the year 1943: DONALD G. MARQUIS........................ 246
A study of 400 psychologists commissioned in the U. S. Naval Reserve: C. M. LOUTTIT......................... 253
Psychology and the war: notes......................... 258
Hull's principles of behavior: S. KOCH....................... 269
Interaction in analysis of variance interpreted as intercorrelation: C. C. PETERS.................................... 287
Note: Shall affiliated organizations have direct representation on the proposed council of representatives?: J. G. PEATMAN... 300
Note: Psychology in occupied Shanghai: C. HART WESTBROOK.. 304
Psychology and the war:
Research program on psychomotor tests in the Army air forces: STAFF PRU NO. 2, and Department of Psychology, School of Aviation Medicine.................... 307
A blinker adaptation of Thurstone's 1943 Code Aptitude Test: H. B. CARLSON & J. RICH..................... 322
The preparation of articles for publication in the journals of the American Psychological Association: JOHN E. ANDERSON & WILLARD L. VALENTINE............................... 345
Psychological disorders resulting from electrical shock: BETTY L. SPENCER.................................... 377
The fifty-second annual meeting of the American Psychological Association, Cleveland, Ohio, September 11 and 12, 1944.. 384
Psychology and the war:
The aviation cadet qualifying examination of the Army air forces: STAFF OF THE PSYCHOLOGICAL BRANCH, OFFICE OF THE AIR SURGEON, HEADQUARTERS ARMY AIR FORCES: Washington, D. C.......................... 385
Psychological consultation service in the Army specialized training program STAR unit: ROBERT W. HENDERSON, 2nd Lt. AGD.................................. 395
Program, fifty-second annual meeting of the American Psychological Association, Hotel Statler, Cleveland, Ohio, September 11 and 12, 1944.................................. 413
Electroencephalography: Review of 1942: RAE GILMAN....... 416
Post-college vocational activities and attitudes of psychology majors: H. B. CARLSON & S. M. WATSON............... 433
Women in American psychology: Prolegomenon: ALICE I. BRYAN & E. G. BORING................................. 447

Note on psychological journals for foreign libraries: W. L. VALENTINE . . . 455

Psychology and the war:

History, organization, and research activities, psychological test film unit Army air forces: STAFF, PSYCHOLOGICAL TEST FILM UNIT, AAF . . . 457
The mobilization of psychologists for war services: D. G. MARQUIS . . . 469
Personnel-psychologists at Stanford University: E. K. STRONG, JR. . . . 474

Psychology and the war:

Clinical psychology in the military services: ROBERT R. SEARS . . . 502
Clinical psychology in Army hospitals: MORTON A. SEIDENFELD . . . 510
Reconditioning program: Army general hospitals: JAMES W. LAYMAN . . . 515
An Army experiment in retraining psychoneurotic casualties: STAFF CLASSIFICATION SECTION, CLASSIFICATION AND REPLACEMENT BRANCH, AGO . . . 519
The personnel consultant in an Army rehabilitation center: STANLEY LIPKIN . . . 524
The new Army individual test of general mental ability: STAFF, PERSONNEL RESEARCH SECTION, CLASSIFICATION AND REPLACEMENT BRANCH, AGO . . . 532
Some testing needs in military clinical psychology: RICHARD WALLEN . . . 539
The clinical psychologist in an AAF mental hygiene unit: MAX DEUTSCHER . . . 543
AAF convalescent-rehabilitation program: ROBERT D. GILMAN & GLENN V. RAMSEY . . . 548
Clinical research in the aviation psychology program of the Army air forces: DONALD E. SUPER . . . 551
The psychologist in the psychiatric program at the Naval training stations: WILLIAM A. HUNT . . . 557
The clinical psychologist in a Naval hospital: MILDRED B. MITCHELL . . . 561
Psychologist in the Naval hospital: T. W. RICHARDS . . . 565
Psychological activities at the U. S. Coast Guard Academy: JOSEPH M. BOBBIT & SIDNEY H. NEWMAN . . . 568
Proceedings of the fifteenth annual meeting of the Eastern Psychological Association: THEODORA M. ABEL . . . 580
Proceedings of the twenty-fourth annual meetings of the Western Psychological Association: RALPH H. GUNDLACH . . . 586

German industrial psychology in the fifth year of war: H. L. ANSBACHER 505
Bibliographies in child development: 1931–1943: FLORENCE L. GOODENOUGH 615
The mechanism of monocular accommodation in man: RALPH H. GUNDLACH 634
Hull's "treatment of learning": BENBOW F. RITCHIE 640

Psychology and the war:

Post-war reemployment prospects in psychology: DONALD G. MARQUIS 653
Psychological work in the U. S. Maritime Service: CHARLES C. LIMBURG 664
Psychology and the war: notes 669

Symposium: psychology and post-war problems:

Educational acceleration and post-war scientific leadership: SIDNEY L. PRESSEY 681
Psychological adjustments of discharged service personnel: CARL R. ROGERS 689
Occupational and vocational counseling of military and civilian personnel during the period of post-war demobilization and the years immediately thereafter: CARROLL L. SHARTLE 697
Expanding opportunities for women psychologists in the post-war period of civil and military reorganization: FLORENCE L. GOODENOUGH 706
Psychology—Some Unfinished Business: H. H. REMMERS . . . 713
Proceedings of the fifty-second annual meeting of the American Psychological Association, Inc., Cleveland, Ohio, September 11 and 12, 1944: WILLARD C. OLSON 725
Proceedings of the Fall Meeting of the Rocky Mountain Branch APA: LILLIAN G. PORTENIER 794

Psychology and the war:

Veterans administration vocational training program: processing procedures used by the College of the City of New York: DANIEL F. BROPHY & LOUIS LONG 795

BOOK REVIEWS

Bochner and Helpern's Clinical application of the Rorschach test: RALPH R. BROWN 64
Rapaport's Emotions and memory: MAGDA B. ARNOLD 65
Langer's Psychology and human living: ROBERT C. CHALIMAN . . 66
Fry's (with the collaboration of Rostow, Edna G.) Mental health in college: HOWARD E. WILKENING 68
Shaw and McKay's Juvenile delinquency and urban areas: DALE

B. Harris 69
Varnum's Psychology in everyday life (2nd Ed.): George J. Dudycha 71
Doherty and Runes' Rehabilitation of the war injured: Calvin P. Stone 127
Penington, Hough and Case's The psychology of military leadership: Horace B. English 128
Gellhorn's Autonomic regulations—their significance for physiology, psychology, and neuropsychiatry: Chester W. Darrow 130
Newcomb's Personality and social change: Clarence Leuba 131
Remmers and Gage's Educational measurement and evaluation: Howard L. Siple 132
Stern's Mental illness: a guide for the family: Stanley S. Marzolf 133
Zilboorg's Mind, medicine and man: F. C. Summer 134
Poluak's The retina. The anatomy and the histology of the retina in man, ape, and monkey, including the consideration of visual functions, the history of physiological optics, and the histological laboratory technique: Forrest Lee Dimmick 192
Landis and Bolles' Personality and sexuality of the physically handicapped women: Katharine M. Mauer 194
Sachs' The creative unconscious—studies in the psychoanalysis of art: Joel Shor 197
Meier's Military psychology: Paul R. Farnsworth 261
Child's Italian or American? The second generation in conflict: Dorothy Tilden Spoerl 262
Jennings' Leadership and isolation: Clarence Leuba 263
Wolff's The expression of personality: experimental depth psychology: Florence L. Goodenough 265
Masserman's Neurosis and behavior: Edwin R. Gutherie 332
Jones' Development in adolescence: John B. Wolfle 334
Bills' The psychology of efficiency: Claude E. Buxton 336
Whitney's Family treasures, a popular guide to heredity: Harold D. Carter 337
Breckenridge and Vincent's Child development: physical and psychological growth through the school years: Nancy Bayley 338
Tomkins' (Ed.) Contemporary psychopathology: Harry F. Harlow 339
Fernald's Remedial techniqes in basic school subjects: Katharine M. Maurer 340
Thorndike's Man and his works: J. R. Kantor 400
Young's Emotion in man and animal: Its nature and relation to attitude and motive: Henry M. Peters 401

Walls' The vertebrate eye and its adaptive radiation: MICHAEL J. ZIGLER.......... 403
Burtt's Principles of employment psychology (Rev. Ed.): ARTHUR BURTON.......... 405
Levy's Maternal overprotection: JOHN J. B. MORGAN.......... 406
Wolff, Gasser and Hinsey's (Eds.) Pain: LYLE H. LANIER.......... 491
Kluver's (Ed.) Visual Mechanisms. Biological symposia. Vol. VII: FORREST LEE DIMMICK.......... 492
Luck and Hall's (Ed.) Annual review of physiology: CLIFFORD T. MORGAN.......... 494
Roberts' Psychology you can use: DALE B. HARRIS.......... 495
Jacobi's The psychology of Jung: JOEL SHOR.......... 496
Yerkes' Chimpanzees. A laboratory colony: W. N. KELLOGG.......... 593
Ackerson's Children's behavior problems: Vol. II. Relative importance and relations among traits: DALE B. HARRIS.......... 595
Glueck and Glueck's Criminal careers in retrospect: LEONARD CARMICHAEL.......... 596
Reckless' The etiology of delinquent and criminal behavior: a planning report for research: DAVID A. GRANT.......... 598
Moore's Psychology for business and industry (2nd Ed.): WILLARD A. KERR.......... 599
Bowley's Guiding the normal child: MABEL F. MARTIN.......... 601
Morgan's Physiological psychology: MICHAEL J. ZIGLER.......... 670
Davidson's Personality and economic background: a study of highly intelligent children: HAROLD D. CARTER.......... 671
McMurry's Handling personality adjustment in industry: ARTHUR BURTON.......... 673
Sargent's The basic teachings of the great psychologists: R. H. WATERS.......... 675
Various. The march of medicine: GEORGENE H. SEWARD.......... 676
Barker, Kounin and Wright's (Eds.) Child behavior and development: CLARENCE LEUBA.......... 803
Kasanin's (Ed.) Language and thought in schizophrenia: WENDELL JOHNSON.......... 804
Salter's What is hypnosis?: WILLIAM A. HUNT.......... 806

MISCELLANEOUS

Books and Materials Received.......... 135, 198, 408
Notes and News.......... 72, 136, 199, 267, 343, 409, 498, 602, 679, 807
Notices.......... 136, 200, 412
Index of Subjects.......... 808
Index of Authors.......... 811

Vol. 41, No. 1 January, 1944

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86
4782

FREEDOM AND CONSTRAINT
OR
POTENTIALITY AND ENVIRONMENT*

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I. INTRODUCTION

For four years most of the world has been at war; for two years we have been at war. And the end is not yet. We who live in this war-torn world cannot but be amazed at the new industries arising overnight, the new products created for war and peace, the changes in the lives and habits of millions, the coordination of human effort over wide areas, the effective conduct of great campaigns, and the new hopes and aspirations springing up in a world that only ten years ago was forlorn and bedraggled. The suffering and horror of war are terrible; no one can, for a moment, forget the blood and sweat and tears underlying all this vast accomplishment. Nevertheless, in the face of all this one cannot help wondering what we might accomplish in peacetime by expending equal thought, energy and effort upon human welfare.

Psychologically war is an emergency which by mobilizing the resources of whole populations brings out high purposes, great energy expenditure, widespread fabrication of material, coordination of effort and an integrated and powerful attack upon the enemy. Invention and scientific discovery stimulated by war solve problems that under ordinary conditions would take ten times as long. Constraints are removed, individuals are freed for new functions, and society itself for new organizations. Out of the pattern of unique experience developments may come within both individuals and social groups that would never arise from more commonplace events. Our wartime experience suggests that the possibilities of effectively utilizing human and material resources are almost limitless, if only the constraints inherent in our normal environments, which inhibit us from expending money, time, and energy, could be removed.

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* Presidential address for the Fifty-first Annual Meeting of the American Psychological Association. Because of the request of the Office of Emergency Management that meetings be postponed for the duration of the war, only a skeletonized business meeting of the Association was held at Northwestern University, Evanston, Illinois, on September 2, 1943. Hence this address was not delivered orally.

Great interest in the environment marks the recent years. Perhaps this grows out of the glimpses given us of what modern industry and engineering can do to create a more desirable life; perhaps it grows out of the increased standard of living, so apparent to those who compare their own status with that of their grandparents. In the modification of the environment lie many of our hopes for the future. For the first time in human history, on a wide scale and among many millions of people, there is some conception of the practical techniques for improving the lot of all. Hopes and aspirations for a better world are as old as man. But insight into the practical mechanisms for the conquest of the universe is only a few centuries old and in many respects only a few decades old.

Two questions arise: What is the effect of environmental changes upon group and individual modes of living? What is the effect of these changes upon the level with which individuals function within the new framework of equipment and skills? These are frequently confused. Beyond question all of us have available better resources and equipment than did our grandfathers and can do many things formerly impossible. Whether we are as able within the framework of our environment is quite another matter. Although both of these questions interest the psychologist, one of his primary functions centers about the second since so much of his work is concerned with the analysis, assessment and prediction of the individual's performance within the framework of his particular society.

Each generation not only has the accretions in the form of instruments and institutions developed by previous generations, but its members also begin adjusting to them at an early age and thus build up the skills demanded over a very long period. For children in the 1920's there were toy automobiles with steering mechanisms like those of large cars. Their fathers who had had no such playthings as children, were forced to acquire the complex skill of steering an automobile slowly in the face of interfering habits set by other equipment. In addition, the modern youth who begins to drive has already had much experience in automobiles, has made many incidental observations on driving and has discussed it with others who are more expert. In this gradual adaptation of the individual to the equipment of the world into which he is born, the level of performance of almost all the persons in the group will be raised. Some may even be convinced that these changes indicate a real change in capacity. But be humble, and remember that given a sheep, a spinning wheel, and a pair of knitting needles, your grandmother turned out a very respectable pair of sox, an accomplishment far beyond most in our society.

The problem is confusing because of the ability of society to simplify processes by making them foolproof and thus bringing them within the reach of all. In test terminology, society does not like high ceilings. Thus, it has so simplified the mechanical and electrical controls of the automobile that where previously only a highly skilled person could drive, now almost any one can. Not only have the driving and braking mechanisms been simplified, but the layout of roads, the elimination of hazards, and the development of signal systems have made it steadily more possible for less able individuals to perform. A psychologist in 1910 asked to give the proportion of people who under any circumstances could drive motor cars would, at the most, have predicted not over 10 per cent. His estimate would have been sound at the time. But he would have been far wrong—partly because of our gradual habituation to the automobile and partly because of the skill of our engineers in making it foolproof. Although the psychologist in 1930 would not have been far off in estimating the proportion of women capable of industrial jobs, because of the research that shows how small sex differences are, he would have underestimated the possibilities of simplifying processes and of breaking operations up into easily learned component parts. Society may make its main advances by developing specialists of high skill who can adapt its machinery to all levels within it.

It is pertinent then to inquire into the nature of the environment and more particularly to our conceptions of it and to examine the methods by which it can be studied. This is a domain too often neglected by the psychologist, who is much more likely to be concerned with the individual.

Life is approached from two points of view. One views the individual from within and asks "What does the person do to his environment?" The person is looked upon as the master of his own fate and the external world becomes the machinery through which he operates. In the studies of the later careers of gifted children (6, 18, 19) and of subnormal children (5), a research technique is developed which makes the individual the independent variable and his accomplishments—the psychological environment he constructs—the dependent variable.

The second views the individual as the creature of fate and asks "What does the environment do to the person?" Practically, we continually seek the principles for changing behavior through modifying the environment. How shall we teach reading, control temper tantrums, build effective study habits? In research, modifying a single factor to produce a particular result is the limited case at one end and modifying a total environment the limiting case at the other. In between are all types of changes in the environment. Here change in the person's behavior becomes the dependent variable and the environment or some part of it the independent variable.

The social and political bearings of these points of view are reflected in the discussion of free enterprise vs. a planned society and of the dignity of man vs. the dignity of the state. One looks upon our primary social task as building inner resources and strengths and the other seeks the improvement of external conditions. Neither presents an adequate picture of the organism-environmental relation. But since there is a spatial separation between the organism and what is about him in the external world, however much the two are interrelated, little scientific or practical advance can be made without separating them in thought. We can speak of the self-contained totality as the personality, and the totality of the outer forces as the environment.

II. THE PERSONALITY

Personality, viewed over a period of time and as a continuity, becomes a system which is composed of many processes, tensions, drives, abilities and mechanisms and which in the process of organization from infancy onward has acquired a certain direction and stability. The person cannot be described without reference to his past, nor can his future be predicted from any momentary manifestation unless the sample of behavior available is known to have predictive value. As a system, the personality undergoes pressures from without, which deform or deflect it. It resists these deformations or changes. Presumably, the more it is developed, the greater is this capacity to resist deformation. When a system meets pressures, it adapts by modifying its own internal relations. Its peculiar virtue lies in its capacity to function by a series of compensatory adjustments which preserves its integrity and balance. Once organization is started, a system continues on in a particular direction with limited chances of diversion. There is inherent stability within an organization which results from its integration about one or another aspect of its possible universe. Such a directional tendency also gives a system a selective character in relation to the environment.

There are also wide differences among the systems we know as personalities in susceptibility to environmental influences. Some who react very little, and are insensitive, are termed the "feebleminded." Others who are very sensitive and show high adaptability, we called the "intelligent." Most persons fall between these extremes. This concept of general adaptability includes not only reactability for the moment, but also over a period of time. Variations in the environment then produce more changes in some persons than in others.

For two decades, the students of child psychology have studied the development of the person. Some of the implications for the interpretation of behavior (1) that come out of this research can be briefly summarized to show the general characteristics of the human personality.

1. As a growing organism, the person moves by infinitesimal changes from a single cell to a complex organization of structure and function at an adult level. In this progression new structures and functions are differentiated, the size and form of structures and the level and effectiveness of function change.
2. The person is a spatially separated unit that functions as an organized whole in the situations he meets. This molar character of the person means that we cannot take him apart and reassemble him, but always work with him as a whole. Psychological terms classify acts by similarity, since one and the same act can be called sensing, learning, emotion, or memory.
3. The person lives in a context which is neither simple nor unitary and which continuously affects behavior and development. Patterns of stimulation come out of this context and are part of it. Because the child is himself an object in space that must apply energy at specific points to other objects in space, behavior becomes specific. In this process the stimulus field and the response system become structured and patterned.
4. As the person moves into and through new zones of experience, new skills and activities are developed. In developing a particular skill to meet the demands of time and place, the person purchases competence at the cost of versatility; with the structuring that is inevitable, some of his original multipotentialty is lost. Because time is limited, selection is

the person which operate upon him and upon which he operates. Prior to their action, the person consists of potentialities which, under stimulation, will move toward or approach limits set by the nature of the organism. Given equivalent amounts of stimulation, practice and motivation, individuals will tend to distribute themselves in a normal frequency, with most near the average and fewer near the extremes. Beyond a certain point, human beings are markedly resistant to stimulation; a principle established for a wide range of physical and psychological circumstances. Thus, beyond a certain level further inclusion of vitamins produces no noticeable effect. Beyond a certain point further stimulation and practice produces no corresponding modification in the behavior level of the human organism. Coaches and teachers of humans at every level encounter these limits. In spite of the skill and effort with which they set up good environments, one child in a few weeks, in an intellectual, artistic, manual, musical, or athletic skill, will do what another with years of the finest instruction and much practice can not do. To deny the existence of limits is virtually to say that assessment, prediction, and guidance are impossible and to substitute for generations of careful scientific work, a completely environmentalist philosophy that has no basis in fact.

That the research worker's conception of the environment affects the character of the research done and, more particularly, what is studied, is shown by the many investigations which report the effect of single factors upon children's adjustment. Mainly, these assume simple one-factor environments and show low positive correlations between the factors observed and good adjustment. Even casual surveys of homes or schoolrooms reveal both good and poor practices within the same context. Studies of problem children trace maladjustments to a wide variety of single factors. Although the existence of some association between each of these and children's difficulties is beyond doubt, the exceptions are many. And in many instances children who make very good adjustments come from environments which superficially seem to be very bad and vice versa. We can not as yet describe an environment such as a home in its totality. If we could arrive at some practical description that would permit classification and separation, different environments could be set up by selection or design and their effects on the behavior of children studied. Although the material and mechanical features of an environment can be described now with some effectiveness, describing its psychological or social features presents great difficulty.

There is also a strong tendency, well illustrated by studies of socio-economic status, to oversimplify the factors involved. On the basis of income and occupation, people can easily be divided into fairly distinctive classes, which show consistent association with various factors, such as intelligence, child care, and community participation. Because of the absence of other ways of classifying home environments in simple terms, there is a striking over-emphasis of the effect of income and socio-economic status upon mental processes and adjustment. Some studies even conclude that differences in such status produce all the variance in intelligence, a conclusion hardly justified by a literature which can equally well be interpreted in terms of the variation in intelligence producing the variation in socio-economic status. The standard of living may be a symptom or symbol of adjustment rather than a primary determiner. At every income or socio-economic level, striking examples of maladjustment in children and adults are found. Likewise at every level many children and adults make very good adjustments. The need of disentangling this picture is all the more important because so many reformers, often the very persons who discount individual success in terms of economic and material goods, hold that the best and perhaps the only solution for human ills is raising the income level. Davidson's study (8) which shows little or no variation in measurable personality traits other than intelligence, suggests that our highly industralized society may select individuals rigorously in terms of intelligence and not select in terms of other personality traits.

To study the environment and bring it under our control, it is necessary for us to view it as a manifold and then ask how it is put together. As long as environment is envisaged as a single continuum going from bad to good or is divided sharply into two disjunctives, little progress will be made in analysis of its effects. When an environment is viewed as a milieu or manifold, it can be represented by a system of coordinates of many dimensions. Symonds (17) proposes a two-dimensional system in which the x ordinate is designated acceptance-rejection and the y ordinate dominance-submission, with the origin indicating the ideal. Although his study shows that there is some significance for each of these in determining adjustment, both dimensions are not studied on the same cases. We may well question, as did he, whether two dimensions are enough.

Observation and study of the management of young children reveal not a single continuum, but a number of dimensions. First is one which may be called *quality*, at one extreme of which are the direct methods of force and compulsion and at the other, the indirect methods of persuasion and leadership. The second relates to the *intensity* with which the methods are applied. Some homes are mild and gentle, while others are vigorous. The third is the *consistency* with which control is exercised in similar situations. Watson once suggested that if all undesirable objects were invariably associated with pain, the child would build up correct habits quickly without emotion and with no need for teaching. Children are punished today for an act that was praised yesterday. When asked to characterize their teachers, children, in surprising proportions, comment on their "fairness or unfairness" and refer not only to inconsistency in the treatment of the same child, but also from one child to another. The clinical literature contains instances of neurotic-like behavior, to say nothing of milder maladjustments, produced by lack of consistency.

A fourth dimension relates to the *pervasiveness* or the range of control over a variety of different situations. Do controls cover all, a large part, or a small part of the child's activities? Are there areas of strict control and areas of freedom into which he may move? This dimension differs from the quality of control with which it is often confused. A very loving mother may dominate a child as completely as does a mother who controls through force. A progressive teacher who sweeps children off their feet by her enthusiasm may exercise as many constraints as a more conservative teacher who rules by other methods. The pervasive mother or teacher with good techniques in other respects, may produce strong feelings of inadequacy in children who do not conform.

Assuming each dimension is divided into two classes, the following sixteen characterizations of an environment in terms of discipline or management can be developed.

1. Direct, intense, consistent, pervasive
2. Direct, intense, consistent, not pervasive
3. Direct, intense, inconsistent, pervasive
4. Direct, intense, inconsistent, not pervasive
5. Direct, mild, consistent, pervasive
6. Direct, mild, consistent, not pervasive
7. Direct, mild, inconsistent, pervasive
8. Direct, mild, inconsistent, not pervasive
9. Indirect, intense, consistent, pervasive
10. Indirect, intense, consistent, not pervasive
11. Indirect, intense, inconsistent, pervasive
12. Indirect, intense, inconsistent, not pervasive
13. Indirect, mild, consistent, pervasive
14. Indirect, mild, consistent, not pervasive
15. Indirect, mild, inconsistent, pervasive
16. Indirect, mild, inconsistent, not pervasive

For purposes of illustration, some of these can be characterized. The first would use direct disciplinary methods of an intense type consistently applied and covering virtually every situation faced by the child. The eleventh would use indirect methods, i.e. persuasive and leadership methods, which are intensely but inconsistently applied but which pervade all types of situations.

The four-variable characterizations give 16 descriptions: if the midpoints are added there are 81. A five-variable characterization would give 32 descriptions, with 243 if the midpoints were also used. But each variable can be divided into seven or more classes. And not all are linear; quality, consistency, and intensity, are probably linear, while pervasiveness is almost certainly curvilinear. Obviously these dimensions, especially consistency and pervasiveness, overlap. But we do not know the amount of overlap, nor whether high intensity accompanies direct methods and mildness indirect methods, nor how consistency is related to either.

We have talked about discipline as an aspect of the home environment. But what of the school, the child's associates and the community, each of which exercises some control? To what degree do these overlap? What is the relation between uniform types of control common to all of these environments and widely differing methods of control in each? What is the relation of methods of management and control to age? What we now know about child management is largely a mixture of common sense and of implications drawn from very limited experiments. As psychologists, we are still baffled when asked pertinent practical questions. And the questions are often of great importance—upon the answer of a single expert may depend the policy of a school system with its many thousands of children.

If we were to add to this multidimensional picture of one of the important environmental complexes, an additional series relating to affection for children, i.e. acceptance-rejection, another relating to the responsibility given the child, another relating to family goals and ideals, and then were to add in the more often studied variables which relate to material possessions, income level, social status, mid-parent education, etc., we would have a very complicated manifold indeed. How many of these complexes and variables are necessary to picture the environment of the child, how much do they overlap, how many are unique, which can be determined with reasonable accuracy knowing some; these are questions that cannot be answered in the present state of our knowledge.

For the present we must assume that the various factors operate equally. With good measurement and scaling we could move on from this assumption to the determination of their weight and interrelationships and then perhaps by the use of factor analysis or similar techniques find clusters or other statistical integrations which would aid us to sort out the significant from the insignificant features of the environment. By viewing cities as constellations and applying the psychological and statistical techniques used heretofore for studying the individual, Thorndike (**20**, **21**) has made significant contributions to methodology and understanding. He finds that a number of variables go together to make a good city and describes their interrelations. This is a beginning attack which shows how a large area or block of the environment can be viewed as a system. The existence of a multidimensional environment should not lead us to think loosely about the environment nor make us unwilling to accept the results of research. Rather it should challenge us to explore the environment both in detail and in total effect.

By deliberately setting up particular atmospheres or social climates and then exposing children to them, Lewin (**13**) has given us a fruitful technique for studying the environment. Lippitt (**14**) found differences in the behavior of children exposed to democratic, authoritarian and *laissez faire* atmospheres. While the extent to which we can generalize from these limited situations to other situations and particularly to the adult situations denoted by the adjectives used to describe the atmospheres can be questioned, the experiments do turn attention from single and specific stimuli to the pattern or whole environment and show that it is possible to develop methods and controls for studying the impact of a much larger environment than those with which we have hitherto concerned ourselves. A substantial literature on the development of social behavior in young children now exists which has many implications for studies on older children and adults (**4**, **15**). It should be possible to find environments in which the operation of known complexes of stimulation can be studied over a period of time. From the studies on discipline in children, it is clear that measures of outcomes must be extended in time and must cover behavior other than that in the immediate situation in which the stimulation is presented. What we now need are opportunities to select or control environments which vary widely in their constitution and to make observations on wide ranges of behavior over a long period.

IV. The Constraints of the Environment

In addition to its resources, the environment contains incentives and constraints both of which are essential features of group living. Because of our limited time it is impossible to discuss the positive features of the environment which are grouped under incentives. The concept of constraint is more important for our immediate purpose.

An environment is more constraining than another when it cuts off the full range of behavior. A constraint may be physical as with confinement; social, as with a taboo; artificial, as with a laboratory limitation. It may be temporary or long-lasting.* In one of its uses constraint is a statistical term, the opposite of which is degrees of freedom. If we constrain, we limit variation. By our experimental design we permit or limit variation. Our use of the term is similar but with wider extension. In research there is a continuum, at one end of which is the laboratory experiment with variation permitted in only one factor, beside the one in which the effects are observed. Intermediate are set-ups in which a number of factors vary and a number are controlled and at the opposite end are the so-called "natural" situations, where no restrictions are imposed as in the modern studies of social behavior in free play situations.

Psychological interest is expanding from very limited ranges of stimulation to contexts which are much nearer life situations. The psychology of the future will use much larger contexts. Already social climates for schoolrooms and for play groups have been set up experimentally. We are also learning that free play, spontaneous conversation, the uncontrolled interview, and spontaneous play in a somewhat controlled situation give psychological data of value. While we are not yet highly skilled in the use of these techniques and are still working at their quantification, measurement and systematization, they are attempts to use types of stimulation and of reaction previously inaccessible to the psychologist, perhaps through constraints arising within our own field.

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* Not all disturbances, barriers, or restrictions are constraints in the sense of the term as here used. In an acute illness, for instance, a person may be near death with no apparent chance of recovery and yet within a few weeks be as vigorous and strong as ever. A chronic illness extended in time is much more of a constraint. An experience, highly charged with emotion, may function as a constraint if it changes the behavior of others and thus becomes extended in time. If, however, recovery is quick without after-effects, there is no constraint. This is a problem of the interaction of the environment and the person which deserves much investigation. In general, a child deprived of stimulation for a time, upon its return, moves ahead with great speed and soon cannot be distinguished from those who have had continuous stimulation. It is likely that the younger the child, the more quickly such recovery occurs. How long must a deficiency last, and at what age must it appear, to act as a constraint?

Methodologically, our problem is one of recognizing, describing and measuring the constraints inherent within any system of stimulation and then systematically changing them to determine their effects upon behavior. Practically, our problem is the removal of constraints which interfere with development and growth. Note that in the sense in which constraint is here used, it is not synonymous with discipline. Some environments that seem free to the casual observer may actually be the most constraining. Some discipline in the popular sense may not even be constraining in the psychological sense, since it may further development. Too much freedom may result either in a failure of organization or adaptation at a simple biological level. A more specific constraint is the absence of the materials, equipment and instruction essential to the organizing of a skill—dearth of opportunities for music for a child of high capability, absence of instruction in reading in a remote district. Other terms such as lack of, failure of, need for, might be used. But the term constraint is better since it implies a cutting down potentiality by a factor or relation within the environment.

An organism could be described in terms of the limits imposed by nature and the constraints imposed by the environment. Because man is limited to arms and legs, i.e. has no wings, he cannot fly on his own; prior to the last half-century he was constrained from flying by a cultural lack, i.e. the airplane had not been invented. A child may have limited musical capacity in a free musical environment or may have great musical capacity in a constrained musical environment.

What I plead for is a thorough-going analysis of the environment in terms of its degrees of freedom and its constraints, in order that we may remove or reduce to a minimum the constraints that prevent individual development. Such an analysis should recognize the new relations which appear with the individual between the individual and his environment and within the environment with the passage of time. Involved also is a criticism of the conception, all too prevalent, that by merely putting a constant amount of something or other into the environment of every individual, the human race is thereby changed and a new world created overnight. Since we are always engaged in the creation of a new world and are ourselves reacting to a manifold, we should go about it with some knowledge of the differential effects of the environment upon the differences intrinsic to the human.

The constraints developed by society are many. Among them are:

1. The social restrictions which go under the general heading of discipline and management control and extend from complete physical restraint to a wide variety of subtle psychological and social restrictions, many of which are embodied formally in law or informally in tradition.
2. The ceilings put by the level of development of the social group itself. These operate to restrict and limit the possibility of development just as low "ceilings" restrict variation in mental test score.
3. The failures to use available natural and human resources, because of ignorance, conflict, and poor social organization.
4. The restrictions of status, caste and class which carry over from one generation to another, and which restrict mobility within the group. If society is to use its human resources to the full, a high degree of mobility within the population is necessary in order that individuals may rise or fall within their own generation in accordance with their effectiveness and independently of social status.
5. The restrictions that grow out of bias, prejudice, hate, and unreasonable attitudes highly charged with emotion.

This discussion assumes that the individuals who make up the human race differ from one another with respect to the capacities which they bring with them, and the speed with which they can organize their capacities. It assumes, also, much variability within the environment with regard to *resources*, *incentives*, and *constraints*. The effect of variance in environments, when added to variance of individuals, is to increase the differences between, rather than to make more similar, the members of a population. When we speak of the *dignity of the human being*, we mean essentially the recognition of individual differences, an environment which permits individual capacity and potentiality to manifest itself, and a social organization that does not exploit some at the expense of others, but facilitates and furthers good group living for all.

V. Interaction between the Organism and the Environment

From the earliest moment of observations, organisms differ in measurable ways. Variability is a fundamental fact of nature. Darwin, who clearly recognized this principle and who is regarded as the great student of heredity, was also one of the outstanding students of the environment (7). He spent his life searching for different environments in order to measure their effects upon various species of plant and animal life. Two fundamental processes recognized by him are: first, variation or individual differences within a species; second, variation in the environment, which, superimposed upon these individual differences, sets up a selective process through which the species over a period of time goes in one direction rather than in another. Darwin also made a clear distinction between the factors that produce and those that preserve or increase variation.

By and large the principle that the environment increases variability seems well established, particularly if we consider the whole broad range of environments rather than think in terms of a relatively homogeneous culture. Most of our experiments deal with a very narrow range of environments. The question whether experience from, say the fourth to the eighth grade, increases variability represents only a minor shift in the environment when compared with the possibilities of the range from no formal education to post-graduate education. The environments in which human beings live vary tremendously., both among individuals and within the life-time of a single individual. One person has seen half of the known world, while another has lived within five miles of his birth place for his entire life. One individual has had much stress and strain, another has had little. One has had much instruction, another little.

What happens when an organism with intrinsic limits moves into an environment of constraints? We are interested not so much in immediate effects upon behavior as with the outcomes of blocking off developmental possibilities over a period of time. If we think of the infant's personality system as multipotential, and see that it may develop in any one of a dozen, or a hundred different directions, the first constraint is one of time. In heaven there is infinite time to permit the complete realization of potentialities. But on earth, the human being can carry on only one major activity at a time and has only a limited time in which to function. The child can acquire only a few skills; he cannot practice the piano while he is playing baseball nor study mathematics while reading novels. The enforced selection may be deliberate but usually is not, as it is intrinsic to the situation. Since later outcomes result from the early selection, the system becomes fashioned. Thus, the constraint of time circumscribes every individual by restricting some possibilities. In the complex system of freedom and constraint, potentiality and limit, the person as a system seeks a psychological homeostasis, which presumably is one of some comfort with reduction of stress and strain. But because the environment is changing and the organism is changing, the balance is never complete. And because the person is a living organism expending energy at a high rate, the balance is not one of minimal effort, but one that is probably nearer maximal effort.

Two general attributes of the environment are important in furthering this process of fashioning. One of these may be called *breadth*. Because the abilities of the human being are essentially uncorrelated, i.e. the low relation between musical ability and intelligence, artistic ability and athletic ability, etc., the human cannot discover his potentialities without some exploration of his environment and of himself. Lehman and Witty (10) found the widest range of activities in children at nine years, with a progressively narrower range each year up to twenty-two. If these results are typical, the breadth of activity at twenty-two is a function of that at nine years, i.e. the selection takes place within the framework of activities available to the child. In a favorable or rich environment children try out more different activities and find those which interest them and for which they have capacity. Thus, interest and skill come ultimately to be related. An aviation instructor reporting differences between English and American boys stated that English boys as a rule had had much less prior mechanical experience with cars, motorcycles, or motor boats, while American boys in the main, have already tried themselves out in many such mechanical situations. Hence, American boys who are awkward or ill-adapted have turned early to other activities and seldom attempt to fly, whereas English boys of corresponding levels do try and have to be eliminated. In the final outcome the performance of both groups is extraordinary, but with one group there has been more early informal selection, with the other more later formal selection.

When rich opportunities are available the individual not only gets some opportunity for the practice and organization of skills, but also makes a personal evaluation of his own assets and liabilities, which is particularly important for adjustment. Since he is also unaware of the resources of the environment, he evaluates the environment. Much of his growing period is devoted to this exploration. In a rich and varied environment the person is much more likely to discover what he can and what he cannot do. The search is a combination of selection and training with some possibility of new direction and ideally involves freedom to drop activities as well as to try new ones. In one sense, this long search is an almost blind trial and error process; in another sense, however, it has logic, direction and inevitability because each choice determines the next opportunity and thus gives some direction and organization to the whole.

It is probable that breadth of environment will further the development of a variety rather than a limited number of forms of behavior and over a period of time produce more flexibility in behavior. It will probably also aid the individual in the discovery of his own possibilities; make more likely the congruence of interest and skill, result in more satisfying modes of life, and make possible a greater contribution to the group. But these questions should be studied with some care as they are basic to the establishment of any practical program of training and education. Particularly, should a rich environment be defined more carefully since an environment may seem to be rich physically when it is actually not so psychologically. Presumably a good curriculum in the early years is broad and permits much exploration, while one in the later years is concerned with *depth* of experience; another attribute of the environment that merits consideration not only in itself, but also in terms of the balance between breadth and depth.

Recent work on the relation between diet and activity throws light on the problem of *depth.*

> Children on a low dietary intake compensate by decreasing their activities and do not show the deficiency diseases that might be anticipated or at least delay their onset. If food is increased, the activity level is increased; if the activity level is raised by outside stimulation, the need for food is increased with more food-seeking behavior. If little food is available and the organism expends energy at a high rate, deficiency diseases appear. Thus, there is a relation both between energy expenditure and deficiency and between nutritive intake and deficiency. If either is stepped up without the other, marked inadequacies appear; if both are stepped up together functioning is at a high level, and if both are reduced together functioning is at a low level. As a result, radical departures in the treatment of children with dietary deficiencies have been introduced which consist not only in providing a high nutritive intake, but also a high energy expenditure, with the result that recuperative processes are speeded up and a stronger physical organism results. Active exercise is now used as a remedial device in many types of cases formerly kept inactive, and is based on the sound principle that the human organism is primarily an energy-expending mechanism. While a state of balance or health can be achieved at any level, good functioning is clearly more than the absence of defect; it implies both energy and stamina—a lesson that is also appearing out of our war experience.

Not quite so much is known about exposure on the mental side. What we do know indicates that a powerful interest integrates the personality, preserves its integrity in the face of stress, and sends it on to high levels of accomplishment. Unless one gets beyond the surfaces of experience into the deeper layers of living, both the individual and his products suffer. We are not so much concerned with the educational implications of this principle, which are many, as with the desirability of analyzing environments in terms of the depth of opportunity permitted. If opportunities for deep concern are not available and no encouragement for strenuous effort is given, the skill and capacity needed by the individual and the group will not appear. Environments can be easy and soft or hard and strenuous. The human being deteriorates in too easy an environment because he is an active living thing that must expend energy. If no desirable outlets that fully engage him are available, undesirable outlets appear.

There is another area of interaction between the individual and the environment that is of very great importance. Shall the environment be *homogeneous* or *heterogeneous* in attitudinal content, or how much of one and how much of the other should it contain? The totalitarian states attempted to create a compact social climate by cutting off access to outside stimulation; by controlling internal agencies of stimulation such as the radio, the press and the motion picture, by breaking down the diverse attitudes built up in the home through organizing the leisure-time activities of children and removing them from home influence for definite periods; and by controlling school content. Only within the last three decades have the mechanical and electrical devices been available which enable a central agency, such as a dictator, simultaneously to reach a very large population from a single source and to reiterate again and again such stimulation. In our democratic society a very different social climate is sought in that we permit the individual access to a wide variety of attitudes and make a virtue of the positive, independent, and self-maintaining citizen who can find his way about. We assume that in an atmosphere of some diversity, internal strength appears.

In rearing children a major problem is that of securing enough homogeneity to give the child stability and orientation, and at the same time heterogeneity enough that he may break free from dependence upon adults and create an independent life pattern. Although our studies indicate the importance of this problem no adequate core of knowledge upon which to base a program of practice is as yet available.

There are also social implications. If we produce too compact a culture by great emphasis upon stability and homogeneity, a relatively sterile culture that remains stationary and which develops many types of restrictions and limitations within itself may appear. A complex climate will increase the likelihood of thorough exploration of and the location of varying capacities and skills which, in time, will contribute to the effectiveness of the whole. Too much emphasis placed upon heterogeneity and diversity may result in a very complex culture which is not likely to hold together because of a lack of the ties that make coherence possible. In both extremes potentiality suffers by virture of constraints, in the one case, by excessive restriction; in the other, by disintegration of the framework of group living.

VI. IMPLICATIONS FOR MEASUREMENT

If the principles developed in the preceding sections hold, they should affect the accuracy with which we can measure human potentiality. Since potentiality cannot develop without stimulation, the measurement of potentiality involves some measurement of the amount of stimulation or some assumption as to its amount. Since an environment provides more uniform opportunities and fewer constraints in some areas than in others, the quality and accuracy of measurement should vary. Moreover, in an environment of high uniformity the measured differences between individuals will be determined to a much greater degree by capacity, while in an environment without uniformity these differences will be masked by experience. If all boys were to throw baseballs under conditions of high motivation for fifteen minutes a day for two years, each would develop some skill and every boy with potentially high skill would be sorted out. But in our environment, some boys throw baseballs thousands and millions of times for many years, while others throw only a few days each year and some never throw. Under these conditions measurement and estimation of capacity for throwing cannot be made without information as to the amount of practice. Environmental constraints may limit the usefulness of measures without modifying the limits of the individual.

Equalized environments of very high uniformity and constancy are achieved in our society when individuals are stimulated to tremendous amounts of practice. Thus, the environments of the professional, whether he be golfer, pianist, surgeon, dancer, psychologist, etc., have a much greater constancy in the psychological sense than the environments of novices, since professional activity involves access to common sources of stimulation in a high degree. In many athletic situations, the most constant environments our society achieves are found. Involved are rigid standards and rules, precise layout of materials, clothing and equipment, rigid limitations within which the action must take place, and officials who enforce rules strictly. Although athletes have come by up different routes, the tremendous amounts of practice they have had equalizes their environments. Individual differences under these conditions do not disappear, if anything they are more marked.

An examination of our measures in various realms of activity is in order.

Intelligence. The modern literature shows that measurements of intelligence can be made with high consistency with results of value for many practical and scientific purposes. May we not then expect that almost every situation presented to the human taps intelligence in some degree and that because of the many opportunities for *its* exercise its measurement is made possible. The school systematically presents the child with problem-solving situations in many areas. In play, with all its different games, the child is exposed to problem-solving situations of many types. If this is true, measures of intelligence should show high consistency, because individuals are sorted out early with respect to intellectual capacities and receive much practice in their use. Moreover, if adjustment in the business and social worlds depends upon such practice, measures of intelligence and success in those worlds should be correlated.

If the components of intelligence tests are analyzed in terms of the amount of stimulation the environment affords for each, those tests which consistently stand up as the best measures would be those for which the environment provides much stimulation and practice. Almost all intelligence tests contain vocabulary tests, either as direct responses to words as in the Stanford Binet, or as variations of opposite tests as in many group tests. A striking characteristic of language is the enormous amount of practice received. A number of investigators have counted the number of words uttered per day by children between two and five years of age with results that range from 4,000 to 15,000 words (2). If we accept 10,000 words as a mid-figure, then 10,000 x 365 equals 3,650,000 per year or over 10,000,000 for three years—an amount of practice that no investigation in learning ever begins to approximate. Even if the results were one-fourth of what is reported, the

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cumulation would be tremendous. A second striking characteristic of language is its high ceiling, which is well beyond the attainment of any single individual. In English there are at least a million words that might be acquired, yet adult vocabularies range from ten thousand upward with one-hundred thousand, or a vocabulary of ten per cent of the possible words near top attainment.

If now we think of the vocabulary to which one is exposed as consistently far above that which is used, it becomes clear that the language environment, despite measured differences between families, is reasonably constant for the child because of the relation between what he can attain and what is available. Although one child may develop in a home in which the combined vocabulary is ten-thousand words, while another grows up in a home in which it is one-hundred thousand words, the difference between these two homes will not become significant until late in the child's development when he will be receiving much language stimulation from other sources. By five years the average vocabulary is two thousand words (16), very far below that of even a very poor home. This does not deny the existence of variations in language with socio-economic status, but it does emphasize the fact that because the ceiling for language is so high in our culture, all children are exposed to a language content far above their capability. Constancy of environment is related both to the amount of practice and to the ceiling. Hence, a vocabulary test becomes a good measure because it is based on the human being's most practiced function, and on a function with a very high ceiling. In a society with a total vocabulary of a thousand words, vocabulary would be a poor test of intelligence after the age of say three years, because the ceiling set by the culture would be far below the potentiality of the average child.

A second component in many intelligence tests consists of arithmetic problems. In our culture the child meets a wide variety of situations in which counting and the manipulation of simple mathematical symbols is involved. If the symbolism were complicated, the child's responses would be dependent upon knowledge of the notation.

The solution of chess problems might be a good measure of intelligence. But play at chess is distributed haphazardly. Children without exposure to the chess notation would be seriously handicapped. If a hundred children by three months' practice were carried beyond the symbolic framework into the real problems of the game and a test were given, a reliable and valid measure of intelligence might be obtained.

Test content may vary widely in difficulty if its symbolic framework is simple and universal. But if the symbolic system is complex and accessible only to a small proportion of those tested, irrespective of the content level, its measurement value will be small. Psychologists have shown great ingenuity in adapting complex problem-solving situations to simple and universal symbols.

That the environment is more uniform in some aspects than in others is shown by comparing verbal and arithmetical ability. All children must use words if they would affect the behavior of others and participate in social life. The demands for the use of numbers are not so widespread within our culture. In some homes children count and play number games; in others both encouragement and facilities are lacking. The school equalizes opportunities somewhat by including arithmetic in the curriculum. But many children have little except formal stimulation with mathematical symbols. Individuals can be expected to come nearer their potentialities in verbal than in mathematical symbols. In many intelligence tests the verbal component receives the heaviest weighting, the mathematical component the next heaviest, followed by other components. A very good intelligence test can be constructed out of verbal and arithmetical components alone.

Motor skills. Except for the early period of very rapid growth, there is an absence of or very low correlation between different motor skills, between motor and intellectual skills, and between motor and other skills. As a result scales for general motor, mechanical or athletic ability do not as yet approach intelligence scales in prediction or usefulness. Motor proficiency is affected markedly by specific practice and a person with even a little experience exceeds one with none. While every child builds up the elementary skills of walking and of hand manipulation, after their acquisition the motor content of the environment varies enormously from child to child. Some boys learn to play baseball, some do not. Some learn to swim and some do not. Some learn to manipulate a saw, hammer, and plane, while others do not. It is quite different with the symbolic skills; every child must improve in talking and problem-solving to participate in the life of his fellows. Hence, measures of general motor ability should be less consistent, reliable and predictive than are measures of general intellectual capacity. On the other hand, measures of performance level and skill in specific motor responses which have been much practiced can be made with high accuracy and consistency.

It is known that mechanical tests given to men and boys discriminate more effectively in terms of potentiality than do those given girls. And girls in normal times freely admit a lack of interest and inferiority. But in the war program, many girls have been found to have substantial mechanical ability and have shown ability to acquire mechanical skills with ease, once they got beyond their initial feelings of inadequacy. For the girl then good measurement of mechanical ability is dependent upon prior exposure to mechanical opportunities. And the lack of such exposure is a real constraint in the discovery and development of such ability among girls.

Emotion. An area in which it is difficult to develop consistent and valid measures for differentiating between individuals is that of the emotions. For the moment we can assume that the capacity for manifesting emotion is relatively stable and that with suitable measuring instruments its level could be determined. Certainly in popular language we make such distinctions of level between persons and are understood by others. Why are we so slow in developing basic measures for emotionality?

If we think of the nature of the environment, the reason will become clear. The appearance of fear in a particular individual is determined very largely by accident. If any group of young children is surveyed, some will be found who have never had unfortunate experiences with dogs; some who have never had any intimate contact with a dog, and some who have only pleasant contacts. Dogs also vary widely in their reactions to young children. If one-hundred, three-year-old children were available, all of whom had had similar exposure to dogs, it is quite likely that with some experimentation with various types of stimulation a stable measure of susceptibility could be obtained. If a number of additional fear-producing situations built upon a basis of fairly uniform past experience in the children were available, a still better measure would be obtained. But life does not subject us to uniform types of emotional experiences nor does it put pressure upon us to develop a common emotional language. We become emotional in contexts of varying degrees of potency, and on rare rather than frequent occasions. In the very nature of the case, it would seem to be very difficult to develop measuring instruments comparable to those in areas of more uniform stimulation.

Social skills. A persistent problem in the field of the prediction of behavior lies in the area of social adjustment where measures would be of great practical value. For some years we have been distinguishing between social and abstract intelligence without much success in measuring the former. At first glance the environment appears to provide much more opportunity for practice in social than in other skills. The number of contacts with other persons, even in early years, run into the thousands. But critical examination of the social environment shows a lack of the uniformity language or mathematical stimulation possesses by virtue of its symbolic system. Moreover, there are very wide variations in family and group social patterns with many indirect pressures and variable direct instruction determining content. After six years a common school curriculum in the intellectual field gives all children similar intellectual experiences. We do not, however, expose children to a common social curriculum, nor do we see to it that the various types of social experience are had in a definite order.

Social experience also depends to a marked degree upon the context of the group with which the child is associated. Intellectual experience is more detached from its context and the problems put are tangible and concrete and lead to more specific answers. In many social situations any one of a half-dozen different responses may be right or wrong. Moreover, social learning depends upon others who are themselves variable, while in the intellectual field much of the learning is concerned with material that is very stable. If this view is correct, we may never have very good measures of social potentiality. If we could expose a group of children to uniform social experience, it might be possible to determine whether or not valid measures of sociality could be obtained.

Special skills. In the more special skills there are some areas such as music, in which all children in modern society are exposed to some type of stimulation, and others such as the graphic arts, in which relatively few are exposed. The widespread distribution of the radio, phonograph, and of musical instruments bring music in some form or other into the home of almost every child. Moreover, educators have been interested in the development of opportunities over a very wide area. Through courses, choruses, glee clubs, orchestras and bands, through local and statewide contests, and through the encouragement of listening and participation, virtually every child receives some stimulation and some opportunity. It is likely that the potentialities of children within a population are more effectively sorted out within this area than in many others. The chances of a child of unusual musical capacity being unnoticed is remote when compared with the chances that capacity for graphic or dramatic arts will go unnoticed. Because musical skill possesses a high degree of tangibility and objectivity, it also has been possible to develop useful scales for measuring capacity and progress.

It seems clear then that any test whatsoever measures both the potentiality of the individual and the environmental opportunities which he has had. Since environmental exposure varies from one area to another and within a particular area from one aspect to another, the individual is engaged in exploring his potentialities. The environment gives him the opportunity for such exploration only if it provides fair amounts of stimulation, but does not do so if stimulation is absent. Without some stimulation tests of potentiality become highly fallible; as stimulation is increased they become better measures. If it is assumed that both time and practice are essential for the organization of skills, it becomes clear that in the absence of opportunities for experience and in the presence of constraints, neither potentiality nor the probable limits of the individual can be determined. The fallibility of a measure would seem to vary inversely with the amount of exposure. Intelligence measures which are highly fallible in infancy, in time acquire a high degree of predictive value (**3**) because the in-service exercise of intelligence provided by our type of environment exposes and sorts out individuals with respect to this capacity. In other areas in which exposure differs more widely, general measuring instruments as valid or as reliable as our intelligence measures have not been developed. In the past little attention has been given the environmental background which makes measurement possible. If we had greater skill in evaluating environments a clearer understanding of the possibilities and limitations of our measuring instruments might emerge.

The concept resulting from this analysis is one of environmental stimulation which varies widely in the frequency of exposure, the number of facilities available, the ceilings and constraints presented, and the amount of organization resulting. If the variance in environmental stimulation is small, because it is universal, uniform, frequent, and of high level, a good measurement of variance in potentiality can be made. If the variance in environment is great, because it is neither universal nor frequent and varies haphazardly in quantity and level for individuals, the possibility of measuring the variance in potentiality is reduced and often made impossible.

Substantial exposure to a stimulating environment is then a prerequisite for the development of the individual and the effective measurement of his capacity.

VII. Conclusion

In this discussion I have turned from the development of the individual, a field in which we have made great progress in the last two decades, to a discussion of the environment. By and large psychologists are not environmentalists in the extreme sense; their profession with its historical tradition centers attention upon the person rather than upon the framework in which he evolves. As one works with children two principles become impressive: first, the essential toughness of human protoplasm from birth onward as shown in its great capacity for resisting stimulation that is not appropriate to nor harmonious with the system of personality being developed and, second, the great modifiability and increased level of behavior of children and adults over a long period of time in an environment that is stimulating in its quality and sound in its totality, even though many elements depart far from the ideal.

A direct attempt has been made in this paper to picture the complexity of the environment in which the human organism develops. Implicit is the view that the organism is multipotential and that the environment is multiform. When the person is regarded as a system and the environment as a manifold, the structure and interaction of both are opened to scientific investigation. In neither instance do we deal with an either-or relation, but with a very complex interaction of wholes and parts. The human being is a complex aggregate of many different structures and functions, with changing interrelations within those structures and functions as development and adjustment proceed and as the intrinsic growth processes approach their limits. He lives in an environment that is composed of many different types of stimulation, many and varied demands, many stimulating and motivating circumstances, and many constraints and restrictions. His own developmental task is the organization of a behavioral system on a broad enough base and deeply enough integrated to enable him to meet the rigors of adult life, to make some contribution to human kind, and achieve some satisfaction out of the life process.

But groups of human beings, especially very large ones, have almost unlimited human and material resources, if they can only achieve a form of organization in which the constraints upon individual potentiality are removed and full development made possible by a stimulating atmosphere and high ceiling. Individual capacity, whether it be motor, linguistic, artistic, intellectual, social or any combination, is the most valuable resource of the group. Long ago William James (**9**) pointed out that the differences in humans, even though small, are very important for society, since they are the sources of social change. The primary function of the psychologist is the assessment of this resource, the study of its limitations and potentialities, the analysis of its learning and the derivation of the principles by and through which its behavior can be modified. But he cannot understand human resources without knowing much about the environment in which human resources develop. Even the study of the simplest response involves at some point an analysis of the environmental pattern that initiates it, or the context in which it appears and changes. It is not then an accident that we have the problems of freedom and constraint and of potentiality and environment—it is the function of the psychologist to furnish the scientific substratum upon which the policies of the education, training and utilization of our human resources are based. Over-estimation and under-estimation alike will cause society to lose faith in us.

A conception of the full utilization of human and material resources for the benefit of man is just breaking in upon us. Everyone expresses it somewhat vaguely and no one quite foresees all the possibilities. Science and invention have given us the modern world through the use and development of material resources, they have not yet given equivalent use and full development of human resources. The psychologist has a significant scientific and practical role; he knows more about man as a person than anyone else—it remains for him to broaden and deepen his conception of the environment by a thorough-going analysis. Let us hope that with the war out of way, that we will have the opportunity, the energy, and the understanding to play our roles in the "years of the modern, years of the unperformed" (**22**).

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SCHILDER'S MIND: PERCEPTION AND THOUGHT AND GOALS AND DESIRES OF MAN

A Special Review

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Schilder, P., Mind: Perception and Thought in Their Constructive Aspects. New York: Columbia Univ. Press, 1942. Pp. xii+432.

Schilder, P. Goals and Desires of Man. New York: Columbia Univ. Press, 1942. Pp. xii+305.

Academic psychologists have viewed with a mixture of healthy agnosticism and pathological skepticism the attempts of psychiatrists and psychoanalysts to formulate a systematic psychology. This kind of attitude has both advantages and disadvantages. Its principal advantage seems to lie in the fact that any new attempts to bring all of psychology under a single theoretical superstructure must be subjected to a careful and painstaking process of verification before being admitted to the inner circle of psychological "schools" and "isms." Obviously such a procedure eliminates much of the pseudo-scientific and quasi-scientific psychological theory that might otherwise creep into the discipline from many spontaneous sources. On the other hand, this indifferent and oftentimes negative reception can, if not objectively treated, lead to the premature discarding of much valuable material. Because of this latter possibility, the author has undertaken a critical review of the last two published books of the late Paul Schilder, hoping to shed some light on the question of their true theoretical merit to academic and clinical psychology.

The two books, both of which were published after the untimely and unfortunate death of Dr. Schilder are: *Mind: Perception and Thought in Their Constructive Aspects* and *Goals and Desires of Man.* It was Schilder's hope to do a comprehensive study of the pyschological data he had observed in his clinical experience and research and to combine these data into a single systematic framework of psychology. Schilder intended this systematic treatment to occupy six volumes. He did not intend this theoretical framework to be of use only to psychologists and psychiatrists but had hoped that it would mark a contribution to the advancement of science in general. The other two published volumes that constituted the major expositions of his system were: *The Image and Appearance of the Human Body*, published in England in 1935, and *Psychotherapy*, published in New York in 1938. Both have been reviewed elsewhere. Still two other volumes on Sociology and Art were only partially completed at the time of his death and have not as yet appeared in print.

It is the purpose of this paper to review his last two published books and to attempt an evaluation of them in terms of existing psychological theory. To do this it will be necessary to borrow freely from his other published works, particularly the volume entitled *The Image and Appearance of the Human Body*, for much of Schilder's material was based upon methods of investigation developed in that study.

Mind: Perception and Thought in Their Constructive Aspects

This treatise represents Schilder's efforts to create some order and unity from a great quantity of empirical data obtained from his clinical experience, his research, and the publications of other investigators. Admittedly, it is a Herculean task to undertake a synthesis of a great deal of our principal psychological knowledge, to say nothing of the enormous complications that are added to such a task by drawing freely from other disciplines such as psychiatry, physics, physiology, etc. Schilder did not stop here, however, for he tried to incorporate this tremendous amount of material into a single and consistent set of general principles. Although the present reviewer does not agree with all of Schilder's ideas, he feels that the work deserves high praise and the careful attention of all who profess an interest in the human being and its manifold operations.

Starting with the problem of perception, Schilder attempted to disabuse the reader of the notion that its data are not reliable. He was firmly convinced that too much emphasis had been placed on the intrinsic value of pure reason by many philosophers and psychologists at the expense of neglecting the fundamental relation that exists among the world, the body, and the self. Adopting a somewhat genetic viewpoint, he engaged himself with the task of discovering the principles of the development of perception from its primitive origins. Reviewing the attempts of certain investigators to localize the most primitive forms of perception in the intermodal experiences of the various senses, Schilder concluded that the answer to the question of the primitive aspects of perceptual experience was not to be found in any qualitative elements or attributes which were assumed by such investigators to be common to all the senses. He did feel, however, that of such views the ones that made motility the common feature of the various senses offered more than the others; however, even motility was felt to be insufficient since he believed that it overlooked the importance of the sensory-motor-vegetative units as such.

As have so many investigators, Schilder singled out the optic field as the sense modality for special attention, without however, neglecting the data of the other senses. The optic field is described as being primarily in a state of continuous, almost rhythmical, movement. While color may be connected with this motion, it is not a necessary aspect of the primitive visual field. Furthermore, "primitive optical experiences are not fully differentiated with regard to the objective and subjective parts of experience. They are in space and indeterminate in reference; . . ." Whether the attribution of subject or object is in the foreground of experience is seen to depend upon the emotional attitudes of the individual.

The point of major significance in the discussion of perception is the formulation of the developmental transition, starting with very primitive stages of experience, to complete experience. This transition takes place in "the process of active reality testing which participates in the creation of gestalten." Perceptions were not conceived as merely outwardly projected sensations, for there existed an ever present distinction between the outside world and the self. He believed that the subjective distinction that was involved was based upon the process of really active experimenting and testing and upon constructive efforts on the part of the individual rather than upon a passive impressionism. He objected to Gestalt psychology as such because of its denial of experience in the formation of gestalten. Indeed, he even went so far as to liken perception to the solution of a jig saw puzzle, where the final picture is created by actively testing in experience the position of the various parts in relation to the whole. The whole or final shape is reached by a process of continuous testing, changing, and rechanging. This process of testing reveals the true nature of the real units of experience, and these units of experience (gestalten) crystallize only through an active process of construction.

It follows that the problem of Gestalt formation is thus not only a perceptual one but also a motor problem, regardless of the fact that either the sensory or the motor factor may be in the foreground. In the process of experimenting, satisfactory (to the individual) patterns of perception (gestalten) are attained. There is a "piecemeal construction and destruction, and organization in definite configurations which may mature from primitive to higher stages of development. Primitive experiences show variability in size, number, direction, space, distance, and rhythmicity. . . . Construction of the object, with a continuous interchange until a comparative stabilization (gestalt) is reached, seems to be the basic principle for the organization of the senses." Primitive perception is marked by a turning toward the source of stimulation. Schilder did not believe that the final aim in life was to incorporate objects into one's body, as claimed by psychoanalysts, but that the construction of the object was essential in itself, and not merely because the object might sooner or later be of some use to the individual.

Considerable mention was made of the problem of space and time perception from which Schilder concluded that the two were inherent factors in every experience. They cannot be considered apart from experience, for they, too, undergo a constructive elaboration. Space and sensory-motor experiences are essentially inseparable and the development of space perception parallels the development of action. Space perception is seen as a function of the libidinous structure of the individual and is, therefore, a decidedly social phenomenon. Since, for him, ideas of space develop around the erogenous zones and in close connection with the fundamental biological drives of the individual, the final appreciation of space is dependent upon the appreciation of personalities. Time, as space, was thought to depend upon libidinous drives and thus to have a strongly marked social factor. Summarizing, Schilder stated that "space and time are in the closest relation to action and drives in quite the same way as is any other perception of the senses." The correlate of the unified action of space and time is to be found in the functioning of the vestibular apparatus. Action is not based upon simple reflexes but is rather closely correlated to the structure of the perceptual world.

Summarizing Schilder's views on perception, "—it is shown that primitive perception develops into a more complete conception and the acknowledgment of objects, through a process of experimentation in which all senses, as well as the motility and the vegetative functions, participate. We have termed this process a constructive process. The rather indefinite and changing experiences become crystallized in the form of more definite units. We also call these units configurations and gestalten. Unquestionably this development is not simply the result of experimentation, experience, and nurture; maturation and the inherent quality of the organism play an equally important part."

Leaving perception, Schilder addressed himself to the task of discovering some unifying principles not inconsistent with those used to explain perceptual processes, to explain the higher mental functions found in man. Starting with a discussion of language, he came to the conclusion that the meaning of words and sentences was "the sum total of the sensory-motor attitudes concerning the expected objects. This sum total is unified in the preparedness to action, or in action as such." The further development of language was conceived as a by-product of the process of getting food and sexual objects. Schilder differentiated between the use of sign and symbol. The symbol is partially identical to the referent. For example, he cited the symbol in psychoanalysis which is partially identical with, or similar to, the referent in the unconscious. This symbol relationship is particularly well developed in primitive language. On the other hand, Schilder believed that the symbol tends to lose its inner relation of similarity to the referent as language develops and, indeed, becomes a sign. He indicated that the correct understanding of language must precede any clear scientific work and progress. Schilder concluded his remarks on language by stating that in the development of language there is a tendency for the careless use of single experiences as a pattern for action to give way to individualized action fitting specific situations.

Memory and thinking are discussed and the conclusion reached that thinking can take place, no matter how cursory, only when there exists some previous experience, even though this previous experience might not be fully remembered. At least, any past experience has the possibility of being remembered. Schilder's concepts of memory and thinking are quite intimately connected with his concept of learning, which sounds much like the old law of exercise. He looked upon learning as the process whereby memory is facilitated by repetition. A great deal of learning was thus thought to occur without any active wish on the part of the individual. On the other hand, and seemingly contradictory, Schilder believed that learning is always practical and is given up when the individual can no longer be convinced that he is profiting by it.

Schilder approached the problem of memory from a somewhat psychoanalytical orientation. Loss of memory was thought of as primarily a case of selective forgetting by which certain situations and experiences are avoided. He distinguished between superficial and deeper types of repression. However, he maintained that repression does not destroy memory traces but merely makes them inaccessible. Finally he argued that the constructive process does not terminate with the first formation of the trace but continues as long as the individual actually tries to remember something.

In its final stages thinking quite closely approximates action. It is a direct preparedness for action directed toward the outside world and during the process the world is either partially or completely represented to the individual in pictures. When disturbances do arise in thinking, they are merely incomplete phases in the process of reality construction. Insight is defined as being an expression of the same basic forces which take place in thinking and perception, while consciousness is defined as a preparedness and readiness for action which is constructed in thinking and perception. Schilder felt that consciousness was not an independent phenomenon but a process of trial and error in perception and thought which continued until the object and outside world were reached. "Consciousness is in itself self-consciousness. It is an attempt to bring experiences into a context. We may also call this context an ego from an analytic point of view."

In summarizing this book we may say that consciousness, perception, and thought are all, in final analysis, social phenomena. They all represent the attempts of the individual to reach some final construction which can only be done against the resistance of the outer world. They do not represent passive phenomena, but dynamic, active processes by which the individual constructs an orientation towards the outer world. The individual is in a constant state of trial and error, constructive and destructive action, by which he achieves a reality orientation. In spite of the fact that we may perceive only phases of reality of the world in which we live, Schilder steadfastly argued that there is no real reason to assume that our approach to the world by such an active process is unreliable. Experience depends upon action, while action is modified by experience.

Goals and Desires of Man

In this volume Schilder attempted to relate the basic motivation and purposiveness of man to the principles of his general theoretical system. He indicated that since human personalities demonstrate a specific character, irrespective of a communality of experiences, one's ego has, therefore, a certain uniqueness, specificity, and constancy. Accordingly, there is an exclusive life history for each individual based upon the unique quality of the ego and the connection between its single experiences. This correlation is a product of the collective functions of memory, construction and configurations. As psychoanalytic investigations tend to indicate that there is an uninterrupted chain of experiences in an individual's life, it is the task of psychology to uncover such a sequence for each individual. To understand completely the connection between the single experiences of a given person requires an understanding of the motivation of these experiences. However, it is well known that much of our behavior is motivated by processes with which we are not directly aware. Accordingly, Schilder believed that the only way to understand the various experiences of an individual, and their motivation, was through a direct observation of the typical sequences in the outward world of that individual. The ultimate validity and reliability of psychological data is thus seen to depend on the extent to which such typical sequences can be established.

Schilder was in disagreement with certain of the fundamental Freudian views regarding human motivation. He felt that Freud was mistaken in his belief that human beings ultimately strive for relaxation and rest because he overlooked the fact that people strive for objects and goals, not for satisfaction itself. When an individual attains some specific goal, he sets about at once for some new one. People are always actively constructing their outward world and not seeking mere passivity. Thus for Schilder the motor functions of an individual could not be overlooked for they play an important part in this process of construction and reality testing for the individual.

Starting with an analysis of aggression, Schilder pointed out that every attempt to study it in isolation is quite futile since it is not a general quality of behavior but has meaning only in a specific situation. He felt that aggression was closely related to the erotic impulses and that the profoundest relations of man to man were of an erotic sort. Children show more aggression against human beings when they do not regard the other's body as having a personality. He felt that psychoanalysts had overemphasized the importance of aggression and did not take into account the fact that each individual has a deep interest in the world in which he lives. Man is thus seen to be basically social and interested in keeping the world with living beings in it. When aggression and destruction do appear they are functions of a final construction which leads to the crystallization of specific gestalten. Schilder contended that it is basically false to consider human activity in general as merely a process of transformation of primary, innate destructive tendencies. Much aggression in adults is simply the expression of a false ideology by which masculinity and femininity are related to aggression and submission.

One of the basic tenets of psychoanalysts, such as Freud and Menninger, is the so-called death instinct by which individuals presumably are motivated to self-destruction in order to return to a state of complete rest. Schilder's attack on such a pessimistic attitude was relentless. He contended that people at no time really want to die. Even people who are dying a horrible death do not want to die but merely want relief from their tortures. As Schilder put it, individuals live "and they expect that they will continue to do so." Direct observation of children and adults failed to confirm any death wish. Schilder had done much research on the observation of attitudes toward death, and did not base his contentions on theoretical speculation. He was of the opinion that at least part of the difficulty with the psychoanalytic formulation of a death instinct was to be found in the tendency to consider the word "death" as a clear-cut entity, and thereby failing to consider the variety of processes covered by it. For him, death was not the true opposite of life but merely the end of life. "There are not only major catastrophes in human lives; minor catastrophes (occurrences, accidents) occur continually. This is merely a reformulation of the fact that there exists an independent world, which goes its own way. The individual confronted with this world tries to construct the data of experience so that he can live his own life and achieve his own aims and goals. According to this formulation, death is an accident, like a flood or an avalanche."

Sex, and its biological and psychological ramifications, are given much attention by Schilder. Starting with the biological aspects of sex, he pointed out that sex and procreation are quite independent of each other. The difference between male and female cells is not fundamental. Each has merely repressed the other's characteristics and potentialities. Sex itself is considered as an expression of incompleteness with an ultimate urge for completion. The individual seeks to complete itself in sexual union; however, Schilder added that in the whole world of organisms there is a drive not to remain static in completeness but to go from completeness to incompleteness.

Schilder agreed with Freud that the psychic apparatus consisted of three aspects: id, ego, and superego, but believed that they were not mutually exclusive entities. He further agreed with the concept of an Oedipus complex but was skeptical of the strength of aggressive tendencies in children, feeling that the psychoanalysts overlooked all the experimenting and construction going on in children. He did not accept the concept of narcissism as such because it did not take into account the fact that knowledge of one's own body is in no way prior to knowledge of the bodies of others.

Discussing the concept of masculinity-femininity, Schilder stated that there is no fundamental difference in the psychological attitudes of men and women, except with regard to the sex functions and the up-bringing of children. He disagreed with the attempts of some psychologists and psychiatrists to base the concept of masculinity-femininity upon a dichotomy of aggression-submission. That women have any marked tendency to prefer to be men was denied and thus he did not agree with the psychoanalytic concept of penis envy.

Schilder undertook an analysis of the problem of human ideologies and indicated that "the individual's goals and aims, his failures and successes, are determined by ideologies." He argued that since goals and aims have to be adapted to reality, there is no difference between psychology and ethics. Both are concerned with values which come from contact with other human beings and real objects. "Whenever we come nearer to reality in our thinking processes or in our perception, we have achieved something in the moral world." Thus, man is visualized as an organism actively seeking contact with his world by which he may become realistically orientated and by which his actions may be guided.

In summarizing this volume, the following points are of special interest. There is a gross sort of causality in psychic experience, but it must not be carried too far. Just as there has been shown an indeterminancy in microphysics, psychic processes are not completely determined by the laws of causality. Drives, desires, and instincts all have aims and purposes and go beyond the mere process of satisfaction as such. Individuals strive to participate in a world which does not just passively exist but which invites participation. While destructive tendencies do exist, they are merely parts of a larger constructive process by which people learn about their world. This constructive effort leads to work which is in final analysis a social act, as are all acts of man. Culture, civilization, habits, customs, mores, all represent crystallizations of constructive human efforts which have led to a change in the outside world. Man evolves in this world as an experimenting agent who is constantly trying to drive into the future by trial and error, and thereby find happiness. Only when the individual strives in his environment and in the world will he achieve full emotional experiences and evolve as a full personality. Life is not directed towards the past but towards the future. From this constructive process rise comparatively stabilized configurations which serve as a basis for knowledge and for action. This constructive value of life is the paramount issue in psychology.

Analysis and Interpretation

At once it is clear that Schilder did not handle his subject in the manner of academic psychologists. In lieu of sections on learning, intelligence, etc., there are sections dealing on homosexuality, sadomasochism, etc. The psychologist will also miss references to such pioneers of theoretical exposition as James, Wundt, Titchener, and Hall, but will find in their place many names that are unfamiliar to him. This is partly the result of Schilder's European background and partly the result of his more pronounced psychiatric inclinations. Much of the material is of a psychiatric nature and, indeed, about all of the case material presented, of which there is a generous amount, is taken from psychiatric practice rather than from the field that most of us understand as clinical psychology. Finally, many psychologists are likely to be at odds with Schilder's work because of a paucity of laboratory and statistical verification. Such individuals should, however, quickly disabuse themselves of the notion that nothing of value can come from mere qualitative descriptions, for while many of us are seeking ways to increase the mathematical validity of our data, few of us have the opportunity to observe first hand the great gamut of human behavior which Schilder viewed in his professional career. It may be well argued that the very best of scientific control and mathematical exposition are of little value in cases where the data so studied are not accurately observed. It is not to be inferred from the foregoing, however, that Schilder did not document his ideas with considerable evidence, for the corroborative material is tremendous. The point is that his data are not treated in the same way as are those of most theoretical psychologists.

Schilder approached the problems of psychology from a viewpoint of naive realism, as have Freud, Jung, Adler, Dewey, and Russell. He did not agree with all of Freud's principles of observation, however, as he felt that Freud based too many of his ideas on the concept of projection which appeared to Schilder as too strong a tendency to revert to Schopenhauer's concept of representation. Schilder believed that Freud also overemphasized the concept of causality in psychic events, although he himself felt that there was as much evidence for causality in psychology as, for example, is found in physics.

The greater portion of Schilder's work was compared by him to that of the psychoanalytic school. He disagreed on many points and in many was in direct agreement. It is interesting to note that his interests did not completely coincide with those of the psychoanalytic group. He studied somewhat under Freud but remained unanalyzed. However, Schilder considered himself a psychoanalyst in the true sense of the word, feeling that he had observed Freudian heritage better than many of those who kept to him personally and followed his words literally and mechanically.

The principal distinction between Schilder's views and those of Freud concern basic forms of human motivation. Schilder did not agree with the Freudian postulation of a death instinct. He felt that it was too pessimistic an outlook for man to assume that he was merely struggling for rest and relaxation. Indeed, Schilder was himself fundamentally inclined towards an optimistic outlook on life and did not agree at all with such pessimistic philosophers as Schopenhauer and Heidegger who contended that man's life was continually lived with a thought and knowledge of impending death. On the contrary, Schilder felt that life had meaning: that there was a purposiveness in life which invited participation rather than passive acceptance. One almost gets the feeling that Schilder believed there was a transphenomenal requiredness operating between the world and the individual, although such an epiphenomenological viewpoint was not stated. That Schilder did not have the opinion that the world served as a mechanical determiner of behavior is quite clear, even though a casual perusal of his writings might lead one to believe that he held to a mechanistic theory of life.

Schilder did not devote any time to the old mind-body problem as such, although he had certain inclinations which he tended to follow. While he believed that psychological processes depended on cortical processes, he did not feel there was any evidence to support the view that there existed a direct cortical representation, by symmetrical connection of excited points, of all psychological processes. He had a pronounced tendency, however, to regard mind as an active process of experimentation and not as a localizable entity. He felt that if psychologists were careful in their observations there would be no need for animal experimentation or, indeed, proof of their work in any other field than their own. He was strongly of the opinion that psychological insight does not impair the results of objective investigations, but rather helps to yield a deeper understanding of them. As a matter of fact he maintained that "when animal experimentation invades the field of higher nervous activity and behavior of animals, it should not be forgotten that its results cannot be valid when contradicting acknowledged results of psychological research."

It is upon such points that the present reviewer is most heartily in accord with Schilder. There seems to be too much tendency by some psychologists to regard human experimentation and observation as nonobjective, while animal work is accorded the status of a pure science. This is an example of a false conception of what is meant by scientific method. As such, science is a method and nothing more and any attempts to make of it anything else are bound to lead to an artificial confusion. As a method, science is as applicable to human as to animal investigations, even though the controls may be more easily obtained in the latter fields. On the other hand, clinicians should not be led to the place where they minimize the value of objective observation. Both clinical and laboratory investigations must go hand in hand if the real nature of human behavior is to be discovered.

This reviewer was rather disappointed in Schilder's somewhat naive and contradictory viewpoints regarding learning. To be sure, he did not devote much attention to this problem, but his conception of learning as blind repetition seems to be quite out of line with the tremendous amount of work done on it in this country. He insisted that learning continued only as long as there was any practical advantage from it to the individual. He defined it as mere repetition which facilitates remembrance. The inadequacy of such an assumption will appear obvious to any psychologists who are acquainted with the work of Köhler, for example.

Finally, it may be said that the merits of Schilder's work are far in excess of the inadequacies. He undertook a rather difficult task and succeeded brilliantly in executing it. His principal contribution seems to be in his insistence upon viewing man as a dynamic, well-integrated, and active organism, constantly striving to achieve meaning and position in a world. Metaphysical speculations are not present in these books, which is decidedly a point in their favor. It is also refreshing to see an attempt to reach a theoretical formulation of human behavior not based entirely upon laboratory investigations but in part upon a direct observation of the human being *in situ*.

These books will probably not be monumental in the sense that certain of Freud's works have been. Neither is it likely that they will revolutionize psychological thought. They will, however, demand the attention of all psychologists who are interested in clinical work. For such a purpose they are crucial, because within them rests a mass of important information. Perhaps had these books been published 40 years ago they would have taken their place in the hall of psychological fame. At least as far as this reviewer can determine, the death knell has been sounded for great psychological systems. We have now come of age. Startling discoveries and theoretical systems will find an ever increasing inertia of preformed opinion to overcome before they can hope for success. It should stand as a monument to Schilder's memory that he was willing to try to overcome this inertia. It is, indeed, very regrettable that he did not live to continue his very important investigations.

A NOTE ON THE AGE-PLACEMENT OF BINET TESTS*

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There appears to be some confusion on the part of Garrett, Guilford, McNemar, Richardson, and Terman with regard to the criterion for allocating Binet tests to their proper age level. Richardson (4, p. 26) states that the criterion is 50% of age passing; Guilford (2, pp. 210–211, 409) asserts that in the light of our present knowledge of psychophysical procedure it should be 50% of age passing, but that for some reason Binet adopted another standard that was rough and ready; McNemar (3, p. 87) states truly that the 50% criterion is impossible, but gives no reason beyond the assertion that it does not matter; Terman (5, pp. 154–155) presents irrelevant reasons to show why the 50% criterion does not work ("the rapid rise of the age-progress curve in the early years and the resulting drastic changes in percents passing, plus the increase in spread at the later ages" (1, p. 197)). Garrett reviews a part of the controversy (1, pp. 196–197) and adds his opinion that "essentially the allocation of test items to specific age levels boils down to a cut-and-fit process. The authors could have saved much space by saying so at the outset."

It can nevertheless be shown by examination that the 50% criterion is amenable to logical reasoning. The existing confusion arises chiefly out of the fact that in the Stanford revisions of the Binet tests the tests are grouped into batteries of six, usually one battery for each year, and that, except for scatter of correct responses, an entire battery of six tests rather than a single test must be passed to earn the subject credit for the full year. If we assume, for the sake of simplicity, that subjects pass all tests until they fail one, and that they fail all thereafter, we can eliminate scatter from our discussion. Then it is apparent that of ten-year olds, for instance, 50% must pass all six tests in the ten-year battery in order that the average M.A. of subjects of C.A. 10 be ten. The 50% criterion is properly applicable to the battery, rather than to any individual test.

Now, if the 50% criterion were used for each test, the proportion at any age level passing all six tests at that age level would depend on the intercorrelation between the tests. If there were only a chance relationship between tests, then, if 50% passed each test, only 25% would pass two tests, 12½% three tests, and 1/64 all six tests. On the other hand, if the correlation between tests were perfect, then if 50% passed any one test 50% would pass all six tests. As the correlation between tests varies from zero to one, at any given age level for subjects at that age level, the proportion passing all six tests varies from 1/64 to ½.

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* I am indebted to Prof. Henry E. Garrett for having read the preliminary draft of this note and for suggestions on the elaboration of certain points.

Conversely, if the 50% criterion were maintained for the entire battery of six tests at any given age level, then the proportion passing each test would vary from 89.09% (the sixth root of ½) to 50%, as the correlation between tests varied from zero to one. This is the condition that the Binet tests must satisfy.

Of course it is not necessary for a subject to pass all tests at a given age level to attain that mental age. It is possible and usual for him to scatter his correct responses. But then the intercorrelation between tests outside such age level and tests within that level must also be considered.

If there were only one test at each level, the 50% criterion for each test would be workable and correct. But as long as there is more than one test on an age level and the contribution of each test is less than a full year the 50% criterion will not work.

Prof. Garrett is correct when he states that the allocation of tests to age levels is a cut-and-fit process. But the fact to understand is that in the fitting the percent passing must on theoretical grounds be more than fifty, and that under no circumstances short of perfect correlation could the 50% criterion possibly work.

It should be noted further that the explanation offered by Terman and Merrill in 1937 (6, p. 22) is perfectly correct, though sketchy: "Other factors, such as the intercorrelation of the tests and the shapes of the curves of percent passing, are also involved."

It has been assumed throughout this discussion that the normal curve is applicable, and that the distribution is continuous.

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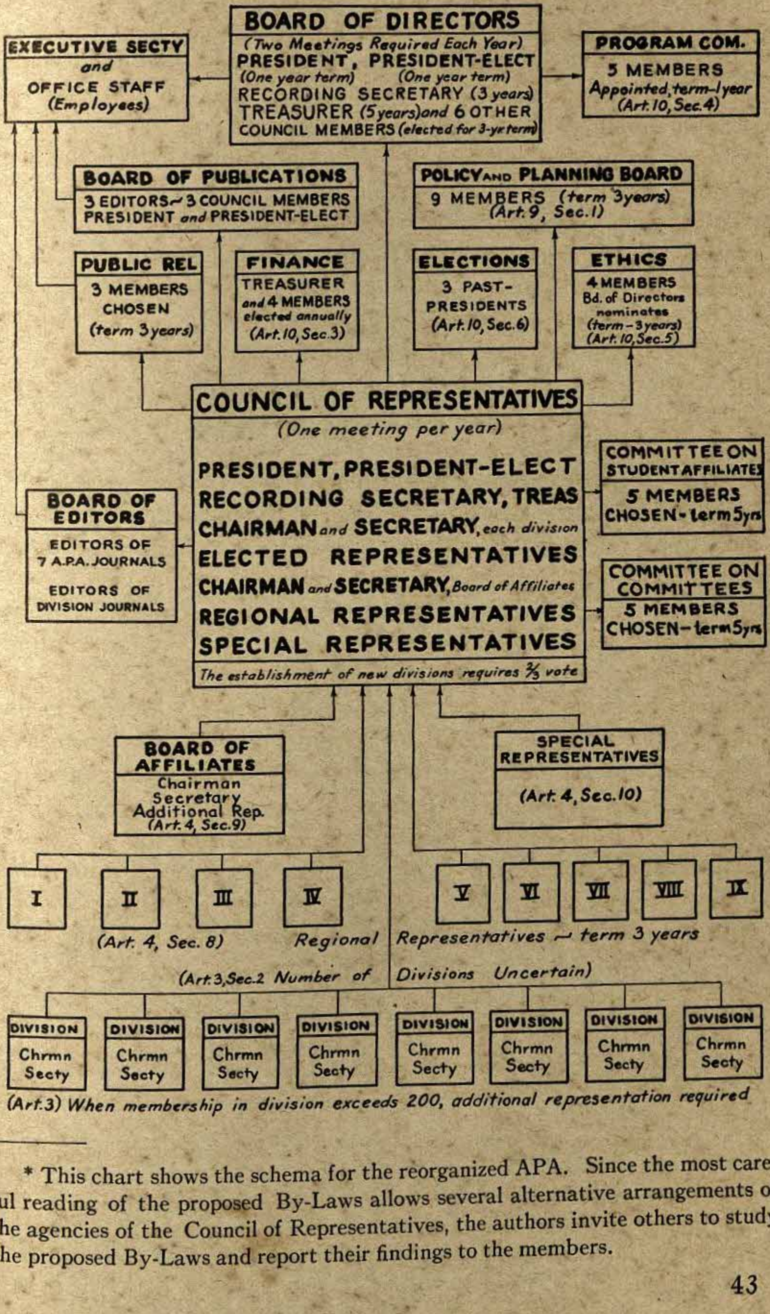
CHART OF THE PROPOSED APA REORGANIZATION*

WILLARD L. VALENTINE AND JOHN E. ANDERSON



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* This chart shows the schema for the reorganized APA. Since the most careful reading of the proposed By-Laws allows several alternative arrangements of the agencies of the Council of Representatives, the authors invite others to study the proposed By-Laws and report their findings to the members.

PSYCHOLOGY AND THE WAR

Edited by

DONALD G. MARQUIS

CONTENTS

OCCUPATIONAL AND VOCATIONAL REHABILITATION, by *Richard M. Elliott*.......... 47

THE CENTRAL EXAMINING BOARD FOR THE TRAINING OF NAVAL AIR CADETS, by *Ellis Weitzman* and *Ralph C. Bedell*.......... 57

THE RELATION OF PERSONAL DATA TO ACHIEVEMENT IN A RADIO TRAINING SCHOOL, by *John M. Hadley*.......... 60

OCCUPATIONAL AND VOCATIONAL REHABILITATION*

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Total war has resulted in the occupational dislocation of many millions of persons. Before the fruits of returning peace can become real, vast readjustments in the life of the nation and in countless individual lives must be effected. Swollen war industries must convert or be liquidated. Labor has to find its way out of war jobs into normal employment. Military personnel must return to peacetime jobs. Disabled soldiers must be helped to become self-supporting and socially useful persons. An orderly, and in some respects a new, peacetime economy must be built. In this tremendous task alert psychologists can foresee that their profession will be called on to play many substantial roles. Not the least important of these—it may turn out to be the most important—is to provide more and better occupational diagnosis and guidance. The demand for it exists. Unprecedented expansion in the use of the sound and useful methods which have already been developed is a real possibility. Ideally diagnosis and counseling should be provided wherever there is a soldier or a civilian who needs it.

How completely inadequate the nation's present facilities are is shown by recently published figures, obtained through the U. S. Public Health Service, estimating the number of physically impaired men, only, between the ages of 15 and 64, who need selective placement at over six and one-half million, the number who need rehabilitation before employment at over one million, and those who need "extensive rehabilitation and sheltered employment" at an additional three hundred fifty thousand. These figures include both men who are in and those who are not in our labor forces, but it excludes men who are essentially invalids or who are in institutions. By far the largest group of those who need selective placement are the males with some chronic disease, while nearly one-half of those needing rehabilitation, mild or extensive, before employment suffer from orthopedic impairment (1).

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* Indispensable aid in the preparation of this statement has been supplied by Donald H. Dabelstein, Director of the Division of Vocational Rehabilitation, Minnesota Department of Education, and Donald G. Paterson, Professor of Psychology, University of Minnesota.

Every person and especially every psychologist interested in rehabilitation should consult four important articles which appeared in the Psychology and War Section of the *Psychological Bulletin*, Vol. 40, November, 1943 (2, 4, 5, 6).

Congress, recognizing that in two areas the need is urgent, has this year passed two laws, similar in many respects, one expanding the program for the vocational rehabilitation of physically handicapped *civilians*, and the other providing for the vocational rehabilitation of *veterans* of World War II whose employability has been destroyed or threatened by a disability incurred in service (4). Under the 1943 law providing aid for civilians (Public Law 113) the program is to be administered on the federal level through the Office of Vocational Rehabilitation of the Federal Security Agency. Federal funds are to be made available to pay the entire administrative costs of approved State programs but the states are expected to pay one-half the cost of the services extended to disabled persons, who must be 16 years of age or over and re-employable. A valuable feature is that the Federal Security Administration is authorized to conduct or to pay for courses of instruction, not to exceed six weeks in length, for the professional personnel of the rehabilitation staff. Costs assumed by the government include tuition, books, subsistence, and traveling expenses. While psychologists will regret the imposed limit of six weeks, they should note two things: first, that a most important principle has been accepted and, second, that we are starting almost from scratch. If anyone has supposed that a six weeks course can adequately train specialists in vocational guidance he has not yet grasped the *professional* nature of the work. Recently we have seen the Army, in wartime, providing a course 24 weeks in length for men who will do certain kinds of personnel work requiring psychological training. The men who complete the course cannot be commissioned without receiving further professional training.

As an interesting indication of future opportunities in the rehabilitation field it may be worth while recording that at a recent conference of State Directors of Vocational Rehabilitation held under the auspices of the Federal Administration a scale of salaries was proposed which, if adopted, would compare favorably with the salaries prevailing in other fields of applied psychology and would be rather higher than academic salaries, at least in the low and middle academic ranks. The normal scale for Rehabilitation case workers, as proposed, runs from $2800–$3400, with a minimum in any state of $2400. Senior rehabilitation workers would receive $3400–$4000; an Assistant State Director, from $4000–$4600; and a State Director from $4600–$5200.

What can a properly organized rehabilitation program do? We all know in a general way that its fundamental purpose is the conservation of human resources and that it aims to assist persons who have suffered from accident, disease, or congenital disability to establish themselves in full-time employment. Services which may be rendered include individual diagnosis, counseling or vocational guidance, medical and psychiatric examination, training, and—when necessary and where financial need can be established—surgery and therapeutic treatment, hospitalization, prosthetic appliances, occupational tools, equipment and licenses, and transportation and maintenance during training.

The duties and responsibilities of a rehabilitation worker are fundamentally like those of a worker in the general occupational adjustment field, though in at least two respects his task is more difficult. First, his responsibility extends continuously from the time of referral of a case throughout a long series of contacts which culminate in adjusted employment. Second, he must draw on a wide background of professional knowledge and experience, since the disabled group with which he works is a typical cross-section of the general population in respect to age (above 16), educational background, social and cultural environment, previous employment, and job capacity. He is equipped with an asset of great value if he has derived some of his knowledge of various types of jobs from industrial experience. He should be a mature person and one sharing the interests which characterize successful adult workers in the general personnel group of occupations.

To indicate in what respects rehabilitation work is psychological in nature, and to give some idea of the sort of training which is, or should be, required of a personnel staff, rehabilitation services may be divided under four heads: Selection and Diagnosis of the Case, Counseling, Rehabilitation Procedures, and Placement.

SELECTION AND DIAGNOSIS OF THE CASE

Basic data to determine eligibility for rehabilitation and to estimate the chances of success include an appraisal of the residual physical abilities of the client, his mental ability, his personal and social adjustments, his special aptitudes, interests and personality traits—all to be weighted in relation to what will be required for successful preparation, adjustment, and performance in an appropriate job. Formal testing procedures and interviews with the client are supplemented by school records, reports from friends, parents, teachers and others who may have observed significant emotions, attitudes, interests and aptitudes, reports from social and welfare agencies covering family and social relationships, and employment records. The diagnostic techniques are identical with those applied in any clinical guidance program. The worker must know the uses and the limitations of psychological and clinical data, and he must be able to sift dependable from undependable evidence and to distinguish between relevant and unessential data. The more thorough and objective his analysis of a case the greater will be his tendency to emphasize general and specific potentialities for job adjustment rather than physical disabilities.

COUNSELING

The future welfare of the disabled person and his dependents is contingent upon the quality of the counseling he receives. Consultation begins with explaining to the client the foundations on which every sound and wise vocational choice rests. Emphasis is laid on the desirability of cultivating self-understanding of one's assets and liabilities without allowing recognition that the liabilities exist to divert one's primary and positive concern from the assets. The techniques are the same as those used in counseling persons who are not disabled. They include providing the client with plain facts as to the demands upon abilities, physical strength, and skills made by various jobs, and the opportunities for employment in them (**2**, **6**). The client must be supplied with information and must cooperate actively in working out his own occupational goals. The plan of preparation for employment must be feasible and congruent with the individual's potentialities and physical condition, and he must know *that* this is so, and know *why* it is so. Since the over-all purpose is to alleviate maladjustment the goal must be acceptable, intellectually and emotionally, to the client. He must see it as his own responsibility to make whatever effort will be required to attain the goal.

REHABILITATION PROCEDURES

The restoration of the disabled person to employment is a cooperative task which may involve a wide variety of community and state resources. A rehabilitation counselor must know exactly what resources may be drawn upon and secure whichever services may be needed to prepare his client for employment. These services include medical care, surgery, hospitalization, fitting out with artificial limbs or other prosthetic appliances, supplying occupational tools and equipment, licenses, and, most frequently of all, training.

Since the rehabilitation service does not maintain its own training facilities, it must contract with established agencies for the particular training required in each case. Knowledge of a great variety of training resources, and knowing just where each is located geographically to determine whether its use is feasible, and judgment as to its appropriateness in all other respects for a particular client, are all absolute essentials for the rehabilitation worker. In many instances it becomes necessary to arrange suitable modifications in existing training, and even to stimulate the setting-up of a wholly new training opportunity, in order to secure just what is needed for a particular client or to prepare a group of clients for a relatively new vocational outlet.

The rehabilitation worker needs to understand the principles of learning, and how they apply in a wide variety of situations. If his psycholcgical background is deficient in this respect—if, for example, he does not grasp the differences between typical learning in school and "learning by doing"—he may try to hold the client to a regime of retraining under which he will become discouraged, decide to discontinue training, or even slide into an attitude of general defeatism. On the other hand, skilfully directed vocational training may be a tremendous morale builder, by giving a disabled person a method of compensating constructively for unalterable handicaps, and at its best restoring the long withheld right of a person who has "felt different" to hold his head as high as anyone else in the self-sustaining community of workers.

The rehabilitation worker cannot relinquish either advisory contacts with the client, or supervisory contact with the agency or agencies supplying service, until the restoration is complete. He is responsible for the expenditure of public funds, and he must assure himself that all is going well, or if not, after restudying the case, promptly introduce the called-for changes.

PLACEMENT

The test of rehabilitation is permanent and appropriate employment of the client, in the regular business and industrial world, at a job consistent with his ability and preparation, and at a wage commensurate with that paid other workers in a similar occupation. This is often a formidable assignment and the counselor must surmount many difficulties which block its realization at the beginning, or which threaten its continuance once a placement is made. The rehabilitation worker has to be well posted on employment trends and opportunities. He must be thoroughly familiar with the placement techniques used with the able-bodied by such agencies as the U. S. Employment offices. He must have a good knowledge of the psychology of accident proneness and prevention, and of workmen's compensation laws and a disabled person's rights under these laws. He must apply with skill and tact the most effective methods of surmounting employers' prejudices against hiring handicapped persons (3). Following placement the rehabilitation worker cannot safely lose touch with his case until he is certain that the client has acquired the skills needed to hold his job and to escape exploitation or discrimination based on his disability. It is clear that in all this the worker will need knowledge, technical skill, patience, imagination, understanding, and persuasiveness. He should inspire confidence through his pleasant and effective way of meeting people, either individually or in groups, and through his maturity of judgment and good common sense.

The Need for Psychologically Trained Personnel

From the above summary description of vocational rehabilitation work it can immediately be seen that many of the technical methods employed are those of psychological testing and measurement, psychological personnel work (especially individual diagnosis and job analysis), and clinical psychology (5). Yet the plain fact is that in 23 years since passage of the original Federal Vocational Rehabilitation Act and appropriation of funds for state use, only a few states have employed psychologists as rehabilitation workers. They constitute but a microscopic percentage of the total group of 314 persons employed in this field by all states together in 1942—a number soon to be increased, it is hoped, to double its pre-war size. This situation should be corrected, and it will be if the psychological profession is quick and realistic in following through its recent gains and if our profession can persuade administrators that rehabilitation work must be put on a professional basis. Psychology has won prestige by notable technical contributions to the sweeping educational trend toward the use of individual guidance at all school levels, by its role in helping to set up sound public and private employment procedures, and by its conspicuous accomplishments in the personnel systems of the armed forces.

Stepwise with measures to bring more psychologists into rehabilitation work, there must come a recognition that a more specialized division of labor in this field is inevitable. The specifications laid down above for the rehabilitation worker do indeed represent him as the very model and paragon of versatility. He is pictured as capable of being all things to all men—and is correspondingly hard to find in flesh and blood. So here, as elsewhere in the development of an expanding profession, specialization of function must come. The time is ripe for it, and the means to pay for it have already been appropriated in part, and more will be forthcoming.

To be sure, this specialization can in some respects be accounted a loss. In the above picture the typical rehabilitation worker has been represented as a single case-selecting, case-diagnosing agent who thereafter assumes complete, continuous and sole responsibility for counseling the client through whatever successes and vicissitudes of training and employment may befall him. Under many circumstances this has been the most feasible arrangement. Perhaps for a long time, especially in isolated geographic regions, it will continue to be standard procedure. But many facts suggest that in increasing measure past practices may tend to be superseded by at least some greater degree of differentiation in the contacts between the client and the rehabilitation staff. The partially distinct roles of the occupational specialist, the psychometrician, the clinical psychologist, and the case or field worker who serves as the training and follow-up supervisor, can and should be distinguished. The clinic type of organization, with its advantage of more refined diagnostic methods and staff conferences and therefore pooled judgments in the diagnosis of a single case, can be used wherever transportation of the client to the guidance center is feasible (5). This will usually not be difficult in the large centers of population, or when it is practicable to take advantage of the provisions of the new Federal Law authorizing payments for the transportation and maintenance of clients in order that they may receive necessary services, including training. Remote areas can perhaps be served by a mobile diagnostic clinic comprised of specialists who will move on when the preliminary study of a group of cases is completed, leaving a field worker in charge.

An additional and compelling reason for raising the issue of specialization of function among the rehabilitation staff lies in a new provision of the 1943 Federal law providing rehabilitation services for civilians. The possession of so-called "functional" disabilities now qualifies a person for aid, if the other conditions such as re-employability, etc., are met. What this comes down to, stripped of technical distinctions, is that for the first time persons suffering from psychoneuroses and the social maladjustments which arise from *personality* disorders are eligible for vocational rehabilitation. It will be seen at once that the importance of the clinical psychologist (and of the psychiatrist, as well as the occupational therapist) on the rehabilitation staff has been increased many times over. Now the case picture as only the well-trained and psychiatrically-oriented clinical psychologist can grasp it will more often be the central factor in diagnosing a case than it has been with clients who were physically disabled. The *person*, in all his clinical complexity, will need really to be studied first and studied thoroughly. Only afterward will the prospects of initiating rehabilitation and the finding of suitable jobs come into relation with the diagnosis. More often than with a physically disabled case, the insights which spring out of the clinical psychologist's professional training and experience might be altogether lost on an admirably competent vocational specialist. The latter, incidentally, may well be a quite different sort of person temperamentally from the "intraceptive" clinician.

Clinical and vocational psychologists, and even psychologists as a total professional body many of whose members will be seeking civilian re-employment in the post-war years, should study the implications and opportunities in this fast developing situation.

VETERANS' REHABILITATION AND VOCATIONAL TRAINING

Under a law passed by Congress on March 25, 1943, the Veterans' Administration is intrusted with the program for the rehabilitation and training of soldiers with service-incurred disabilities by virtue of which they have become unemployable (4). Vocational Advisement and Training are included up to a maximum length of four years of training, during which the disabled veteran receives a pension, adjusted to the number of dependents. It is unnecessary to make any long statement here describing the projected procedures for carrying out the provisions of this law. Detailed plans are still being worked out.

Actually the principles of case diagnosis and rehabilitation are the same wherever they are to be applied. Many additional opportunities for counseling and training will be open to ex-soldiers, some of which may be non-governmentally sponsored, as by the

Red Cross and the American Legion. The Vocational Advisement Division of the Veterans' Administration is at work now on its plans to provide its own diagnostic counseling facilities working with and through a staff of rehabilitation field workers. In at least one instance (Minnesota) the State Director has already set up a diagnostic and counseling clinic headed by a vocational and clinical psychologist with a wide background of previous experience in guidance and rehabilitation and with Ph.D. training in psychology.

The facilities of the Veterans' Administration will of course be supplemented by the use of existing non-governmental agencies of every kind and description which can furnish guidance, training, placement, and follow-up—much as the civilian rehabilitation program now does. Only so could there be any hope of supplying the requisite services. Meantime, it is to be hoped that steps may be taken to increase at the earliest possible date, through professional training, the available rehabilitation personnel.

Well-conceived and reasonably liberal plans are also under way to provide vocational guidance and education for veterans who have *not* incurred disability at the time of discharge from the Army. Up to the present time Congress has not been asked to consider the legislation necessary to put such a sweeping plan into effect. It appears to be not unlikely, however, that eligible veterans, after adequate individual diagnosis and recommendation, will be offered free tuition and maintenance while enrolled in an approved curriculum of general, vocational or professional education, ordinarily for a period not to exceed one year. No soldier may receive training for any occupation unless it is believed that the existing supply of trained personnel in that occupation, or profession, is likely to be insufficient to meet the expected demand. An extension of this educational plan permitting longer training periods in selected fields, either for picked students whose professional education was interrupted by entrance into service, or for other veterans with special abilities, is also under consideration, with favorable action by Congress extremely probable.

The response from the psychological profession to the immediate and prospective opportunities in the fields of occupational and vocational rehabilitation should be enterprising and prompt. First attention might well be given to an overhauling and expansion of the existing training opportunities in the fields of vocational psychology and clinical psychology. In the past there has been insufficient stress in these areas, and throughout applied psychology, on in-service apprenticeships. The use of these, perhaps under the designation internships, might well become almost universal for graduate students, on both the M.A. and Ph.D. degree levels, who entertain doubt (or should be doubting!) that their professional lives will lie exclusively in the classroom or research laboratory. Curricula so theoretical that they seem to be planned almost solely to produce research specialists have their place, but not to the exclusion of curricula designed to turn out psychological "practitioners" and technologists.

It requires no gift of prophecy to foresee the demand for all sorts of psychotechnology in the post-war world. Now is a fitting time to get rid of a "cultural lag" in the educational processes by which we make psychologists. Let us be sure that we are realistically prepared for our bright future. The love of scientific discovery will still continue to be our strongest historical tradition, as it should be in every science, and especially in a young science. We need not fear that pure research will be neglected or that we shall fail to press on—on all fronts—to the devising of ever more refined methods of analysis and measurement.

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THE CENTRAL EXAMINING BOARD FOR THE TRAINING OF NAVAL AIR CADETS*

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The Central Examining Board† was established in 1942, in the Ground Training Section of the Training Division, Bureau of Aeronautics, (now attached to the Office of the Chief of Naval Operations), U. S. Navy. The Board, composed of a staff of officers experienced in large-scale educational measurement, is responsible for evaluating the achievement and advancement of all Naval Aviation Cadets in various ground school courses. All examinations are prepared by, or under the supervision of, the Board, which also controls the methods of test administration and scoring, and determines the basis for ranking cadets. The results of testing are reported promptly to those responsible for the quality of the instructional program. By reporting the test findings in such a way that each school is aware of how it compares with all other schools teaching the same curriculum, a spirit of friendly competition is fostered. This competitive spirit has been a powerful incentive, motivating school staffs toward improvement which is quite apparent through higher standing on subsequent tests. In addition, the examining program assures that what the Navy desires taught is taught.

The Board members work in close cooperation with technical experts in the field of aeronautics who analyze the skills and understandings needed to perform adequately the duties of Naval combat pilots, and who participate in the construction of test items. The two groups continuously review each item in the light of statistical data and validity for the curriculum. Such a harmonious working arrangement between those thoroughly acquainted with aviation on the one hand, and those skilled in testing techniques on the other, gives every indication of being the ideal situation for examining aviation cadets and has implications for other practical testing programs.

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* The opinions or assertions contained herein are the private ones of the writers and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

† The members of the Central Examining Board are: Walter F. Robinson, Lieut., USNR, Officer in Charge; Walter J. McNamara, Lieut., USNR; Ralph C. Bedell, Lieut., USNR; Allen O. Gamble, Lieut., USNR; Ellis Weitzman, Lieut. (jg), USNR.

The achievement of cadets, once clearly determined, forms a basis for modification of administrative procedures, improvements in instruction, changes in textbooks, remodeling of training equipment, and in general, the facilitation of cadet learning.

All tests are of the objective type with constant emphasis upon the accurate measurement of the cadet's understanding and application of essential principles, ideas, and skills. Mere factual recall, though essential for certain parts of training, is never sufficient. Tests must be guided by the objectives of training which are realistically based on the functions of competent officer-pilots. The same tests are given in all schools under uniform conditions. Such a program makes it possible to interpret learning progress against a background of national norms and an array of data which would have been astounding in pre-Pearl Harbor times. In addition, the instructional staff is relieved of a time-consuming and distractive burden, thus permitting them to concentrate their efforts on teaching.

Once the examinations have been prepared, they are administered by the instructors under the supervision of the officer in charge. Answer sheets are sent immediately to the Central Examining Board for scoring and analyses.

Results of tests must be translated into improved cadet learning in the shortest possible time to insure that no cadet enters more advanced stages of training lacking any of the necessary understandings and skills. No longer can a training program be content merely to apply data from one class of cadets to the instruction of the next. A cadet's ignorance may cost him his life, and us our battles. The rapid handling of millions of test papers annually is made possible by the use of a battery of electric test-scoring machines equipped with graphic item counters, capable of handling several thousand test papers per hour. (The large number of tests is due to testing each week's progress in each of several subjects throughout the extensive training period.) National norms are used in assessing learning progress. Schools and instructors receive not only test scores, but are also notified of specific instructional weaknesses revealed through analyses of test results. The instructors, on the other hand, are encouraged to aid the Central Examining Board by submitting suggestions for improving the tests.

In keeping account of the contributions of psychology to the war program, it is well to include the work of those engaged in achievement testing. New examining techniques and improved uses of test results are developing from the exigencies of war. Progress in the large-scale assessment of learning achievement in flight personnel and the use of tests for the improvement of instruction and the facilitation of learning are marked contributions. The urgent needs of the time call for speedy, accurate, and above all practical, measurement of progress. Any weakness in such a training program would lead to a fatal weakness in pilot training.

THE RELATION OF PERSONAL DATA TO ACHIEVEMENT IN A RADIO TRAINING SCHOOL

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The curriculum, the measures of achievement, the predictive devices and the validity of these devices in predicting achievement at the Utah State Agricultural College Naval Radio Training School have been previously discussed (1). The purpose of the present study is to investigate the relationship between achievement and other individual differences not directly measureable by tests. The tests used were exclusively for experimental purposes and do not represent standard Navy practices.

The data to be discussed are derived from the personal data sheets of 275 sailors and 345 marines who entered the school in six companies from 95 to 116 men at monthly intervals from March 22, 1942 to August 22, 1942. Following are the percentages of the men possessing previous radio experience, college training and those over 25 years of age:

	Previous Radio Experience	College Training	Age over 25 years
Sailors	64%	41%	47%
Marines	7%	84%	28%

It will be noted that the majority of the sailors have had previous radio experience and the marines possess, in general, much more college training. These differences as well as the age difference are apparently a function of the selection policies of the respective organizations.

Table I presents the results from comparisons made in terms of the above factors. Considering first the comparisons between the marines and the sailors, we see that the sailors excel the ma-

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* The author wishes to acknowledge the constructive criticism and assistance of Professor Arden N. Frandsen who is actually a collaborator in this research and also to express appreciation to Lt. Commander S. R. Stock and Chief Instructor Edward W. Payne for the privilege of being allowed to collect this data.

† The opinions and assertions contained in this article are those of the author and are not to be construed as official or reflecting the views of the Navy Department or the Naval Service at large.

rines in achievement and in technical knowledge of electricity. The higher achievement of the sailors is supported by the fact that the percentage of marines transferred from the school as inept is approximately three times the percentage of sailors so transferred. Furthermore, the subjective reports of the instructors indicate that the sailors are more cooperative and are generally better students. In order to ascertain whether this difference in achievement is due to the superiority of the sailors in technical knowledge of electricity or was a function of a lesser degree of motivation on the part of the marines, a group of 112 marines were matched with an equal group of sailors with identical scores on the tests of electrical knowledge. The average achievements of this selected group of marines is 63.80 as compared with an average of 64.35 of the equivalent group of sailors. The difference of .55 is

TABLE I

COMPARISONS OF GROUPS UPON THE BASIS OF TESTS AND ACHIEVEMENTS

	Mental Ability	Mathematics Ability	Information Test, Electricity	Technical Information in Mathematics	Technical Information in Electricity	Interest Questionnaire	Mathematics Achievement	Electricity Achievement	Laboratory Achievement	Average Achievement
Marines	57.7	36.0	82.2	43.5	75.0	193.8	61.4	61.4	67.8	62.5
Sailors	52.9	35.5	98.6	44.5	93.7	202.6	62.1	64.3	72.4	66.9
Difference	4.8	.5	16.4	1.0	18.7	8.8	.7	2.9	4.6	4.4
D./S.E. Diff.	8.3	.4	12.0	.6	5.8	2.5	.5	2.2	4.6	3.9
No Experience	57.6	36.4	87.8	44.4	76.9	195.8	61.8	62.4	68.8	64.3
Experience	52.2	34.9	95.0	41.5	99.1	207.2	60.2	63.2	71.5	65.4
Difference	5.4	1.5	7.2	2.9	22.2	11.4	1.6	.8	2.7	1.1
D./S.E. Diff.	5.1	1.4	4.5	1.3	7.5	3.1	.9	.6	2.4	.9
Age under 25	57.2	37.2	92.3	43.1	78.9	197.6	62.5	61.8	69.1	64.4
Age over 25	54.5	33.7	92.3	45.0	85.4	198.3	60.6	63.4	71.3	65.6
Difference	2.7	3.5	.0	1.9	6.5	.7	1.9	1.6	2.2	1.2
D./S.E. Diff.	3.1	3.1	.0	.9	2.2	.2	1.1	1.2	1.9	1.0
No College Training	52.0	33.8	91.8	43.3	95.3	204.5	48.5	58.1	68.6	61.8
Some College Training	58.1	38.4	86.8	43.5	79.5	195.7	63.4	64.0	70.8	66.1
Difference	6.1	4.6	5.0	.2	15.8	8.8	14.9	5.9	2.2	4.3
D./S.E. Diff.	6.5	2.8	3.3	.1	4.4	2.4	8.9	4.2	1.9	3.3

in favor of the sailors but in no way approaches statistical significance. It would appear, therefore, that if the marines were carefully selected as regards their knowledge of electricity, their achievement would compare favorably with that of the sailors.

Since the sailors in this study have enlisted specifically for the study of radio and do have higher average ratings and pay allowances than the marines, their superiority may be due in part to a higher degree of motivation and application. However, this is not a general factor and does not seriously affect the relative achievement of marines who possess a comparable amount of electrical and radio knowledge. However, certain instances of failure to succeed may be eliminated by the selection of only those who are definitely interested in this type of specialized training.

A second comparison was made between those who reported some previous radio experience and those who reported no such experience. The differences in achievement in favor of the experienced group in all cases except mathematical achievement are small and only in the instance of laboratory achievement, do they approach statistical significance. When a group of experienced men is matched with a group of inexperienced men upon the basis of pre-test scores on the tests of electrical information, the difference in average achievement is actually very slightly in favor of the inexperienced group but is not significant. The important factor again seems to be the knowledge of electricity and not the mere possession of experience. Experience, of course, is helpful, especially in laboratory work, if accompanied by knowledge but by no means essential.

When the men over 26 years of age are compared with those under 25 years of age the differences are insignificant although with the exception of achievement in mathematics the achievement scores are in favor of the older group.

In these first three comparisons, it may be noted that in each case the group with lower average scores on the intelligence test is the group with the high average achievement. This fact supports the findings previously reported by Frandsen and Hadley (1), as respects the relative importance of intelligence test results as compared with the predictive significance of mathematical and electrical knowledge.

When the group possessing some college training is compared with the group with no college training we see that the college group excels. This difference in average achievement is maintained when the groups are matched upon the basis of electrical knowledge. The difference in this case is 8.12 giving a critical ratio of 3.92. When the groups are matched upon the basis of mathematics pre-test scores, the college group still excels in average achievement but the difference of 1.89 is not statistically significant. This suggests that college training is advantageous although it is possible for a student to succeed very satisfactorily without such training.

From these results and those previously reported by Frandsen and Hadley (1), it is evident that there would be fewer instances of failure if selection for this type of training was made upon the basis of tests of mathematical and electrical knowledge. Other factors would seem to be of secondary importance although experience, college training, and especially the desire to study radio are definitely advantageous.

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BOOK REVIEWS

BOCHNER, RUTH & HALPERN, FLORENCE. Clinical application of the Rorschach test. New York: Grune & Stratton, 1942. Pp. 216.

In conversation with a psychologist during a recent convention, this reviewer mentioned that a small group of us were meeting regularly to discuss principles and methods in Rorschach. The psychologist promptly asked, "And do you sing hymns, too?" This question reflects the general attitude of many psychologists toward the Rorschach test and its proponents. Bochner and Halpern will at least convince psychologists that the test is not a cult or a religion, but this book will not serve to overcome the general objection to the test on the grounds of undemonstrated validity. For example, such statements as "de are evidence of constriction. This is logical in view of their location on the blot. The individual who clings to the periphery is one who fears to attack the heart of a problem. This is a neurotic manifestation and is associated with evasion, anxiety and compulsion." (28) These should not be taken as a reflection upon the authors, however, since they were principally concerned with presenting in a simple, condensed form the principles of administration, scoring and interpretation of the Rorschach. It is unfortunate that the authors did not include a chapter on validity. Sufficient material is now available to convince most of us that the test is fundamentally sound, even though subject to misuse by over-enthusiastic proponents.

For the beginner, the book offers a lucid and concise description of Rorschach testing. It is not sufficiently complete, however, to permit the beginner to score and interpret the test without consulting other references. There is no clear method of differentiating between major and minor details. The scoring of good and poor form quality is also left to the imagination. As an independent presentation, therefore, this book does not compare with Beck's "Introduction to the Rorschach Method," or "The Rorschach Technique" by Klopfer & Kelley.

The advanced student of Rorschach will find much of interest in this book. The chapters dealing with interpretation of the symbols are well written and bring together under one heading the opinions of various Rorschach workers. Many of these interpretations are not from Rorschach and care must be exercised in the differentiation of well established Rorschach principles from the more recent and less well founded interpretations. The illustrative records are interesting and expertly interpreted. There are not sufficient records presented, however, to serve as a satisfactory background for "getting the feel" of records in various clinical categories.

This book is recommended as supplementary reading for beginners. For the more experienced Rorschach worker, it offers a number of interesting records and interpretations.

RALPH R. BROWN

U. S. Steel Corporation of Delaware

RAPAPORT, D. Emotions and Memory. Baltimore: Williams and Wilkins, 1942. Pp. 282.

The special merit of this book is the integration of psycho-analytic findings (both clinical and experimental) with research in general psychology. While recognizing the contribution of psycho-analysis to psychological theory, most academic psychologists have felt the need for a careful evaluation and interpretation of psycho-analytic tenets before experiments based upon them could become common scientific property. Rapaport supplies this deficiency in a field which all too long has neglected clinical evidence in favor of laboratory experiments.

Rapaport starts out with a definite point of view. To him, memory, as every other human function, is motivated, charged with "energy," colored by emotion. Thus memory is conceived as a motivated behavior phenomenon and emotions as motivating factors.

In an attempt to clarify the concept of "emotion," Rapaport surveys various theories and definitions and concludes that "emotion felt" as an object of investigation has been neglected for research in concomitant physiological processes. As memory phenomena cannot be equated with equally clear cut physiological events, it is "emotion felt" which will have to be conceptualized before the relation of emotion and memory can be clarified. Rapaport's own preference is for a conflict theory of emotion which, like the psycho-analytic theory, would assume an unconscious process between the perception of the stimulus evoking emotion on the one hand, and the experience of emotion as well as the peripheral physiological symptoms on the other.

Chapters II to VII constitute a survey of the field of memory investigation. From his scrutiny of experimental and theoretical contributions of general psychology the author concludes that the so-called "emotional factor" influencing recall represents in fact a multiplicity of factors which, he suggests, may form a hierarchy of emotions. The core of this hierarchy would be the energy derived from conflicting instinctual drives which would be organized in various levels of emotional expression. They would appear on one level, e.g., as "attitudes," "sentiments," "complexes," or "determining tendencies," "needs," "tension systems" (according to the prevailing terminology) and so determine the reactions of the personality as a whole. On the next level, they would be organized as "feelings," "affects," shading gradually into more goal-determined factors such as "interests." Finally, the last derivative of the instinctual drive would be "likes" and "dislikes," and on a still more impersonal level "pleasantness" and "unpleasantness." This hierarchy of emotional expression would influence memory both quantitatively and qualitatively, determining not only how much is recalled but also the whole pattern of what is experienced and what is remembered. He suggests that memory has emerged from a primitive instinctual response with maximal emotional content to more intellectualized forms with minimal emotional content.

Considerable space is given in Chap. V to the contributions of psycho-analysis—theoretical, clinical and experimental. The repression mechanisms (displacement, symbolization, etc.) are considered as specific memory functions by means of which the instinctual drive is expressed on various levels. One is inclined to deplore at this point the author's too-firm allegiance to the psycho-analytic conflict theory of emotion. As a result, his own formulation typically centers on conflict-derived affects and carefully evades emotions like joy or affection. This is the more surprising as he explicitly provides for "interests" and "likes" as well as "dislikes" on the more intellectualized levels of his emotional hierarchy.

Memory phenomena in hypnosis and memory pathology (amnesia, multiple personality, Korsakow syndrome) are adequately covered in the next two chapters. The author sees a continuous transition from repression to hypnotic and somnambulistic states and finally multiple personality; just as in repression a memory connected with an unacceptable striving cannot emerge, so whole sets of strivings may become unacceptable and whole periods become unavailable. Even the Korsakow syndrome implies important emotional components which determine the appearance of memory losses.

Finally, Rapaport quotes some direct experimental evidence (Chap. VIII) of the influence of emotion on memory—direct in the sense that perception itself and thus the "registration" of a memory is shown to depend on emotional factors. The types of experiments reviewed range all the way from the reproduction of learned material to projection experiments, in all of which Rapaport sees the affective factor as the common denominator influencing both memory and thought production.

In a concluding chapter, the author summarizes the conclusions he has drawn from the evidence presented. Affective drives are active in organizing thought and memory processes on different levels of expression, either transiently (evident in falsification of individual memories, slips of the tongue etc.) or more or less permanently (illustrated by interest-directed normal thought processes down to the extremes of wish-directed pathological thinking).

As Rapaport's conclusions imply, this book is not so much a survey of experimentation in two related fields as an attempt to arrive at a new systematization which would integrate the knowledge gained from experimental and clinical evidence. The material is well selected and always relevant but should be considered as documentation for the author's point of view rather than an exhaustive impartial review. As a new systematization, Rapaport's point of view is both stimulating and challenging and should pave the way for much further experimentation.

For classroom use, the summary and bibliography at the end of each chapter should prove particularly helpful.

University of Toronto MAGDA B. ARNOLD

LANGER, WALTER C. Psychology and human living. New York: Appleton-Century, 1943. Pp. vii +286.

"This will not be an easy book to read," says Dr. Keliher in her preface, and the reviewer can attest to the truth of her statement. Why such is the case is probably due primarily to the inherent difficulty of the subject matter. Dr. Langer is not content to give a superficial account of human behavior and the ways in which personality develops. He tries to present the underlying dynamics, and this, in the present stage of psychological knowledge, is no easy task. In addition the book is rendered more difficult by the condensed manner of presentation; more space could well have been devoted to further elucidation of the points made along with more and less obviously "manufactured" illustrations. Perhaps a judicious use of charts would also have helped, although the author is to be commended for not using the type of over-simplified and misleading charts so frequently found in books of this character.

This book is one of a series presented by the Commission on Human Relations of the Progressive Education Association. It is designed according to the publishers "to serve as a textbook for courses in introductory psychology, personality and personal problems, mental hygiene, and the like." It differs greatly from the usual textbook, however, in many ways. No sources for additional reading are given; only occasionally is evidence presented to back up statements made; and although in the first part of the book the author is careful to warn the reader as to his assumptions and hypotheses, later he presents a great deal of theory as if it were established fact. Little use is made of psychological literature. Although Hobbes, McDougall, Sanford, Trotter, and J. B. Watson are mentioned, there are no specific references to any other psychologists save two. These two are H. A. Murray, upon whom Langer states that he has relied most heavily, and Freud.

Langer begins by a somewhat over-simplified presentation of the ideas of primitive man, and then proceeds to show, in a very able way, why "will-power," heredity, and "human nature" are unacceptable as explanatory concepts for human behavior. He devotes nearly one third of the book to a well organized and systematic discussion of physical, social and egoistical needs, their forms of expression and their destiny. The value of this section would have been greatly enhanced if the author had indicated which needs he considered basic and which derivative along with pertinent evidence. Although Langer does not suggest that the social and egoistic needs are innate, yet his manner of exposition may induce many readers to believe that e.g. Silas Marner became a miser *because* he had a strong *need for retention.*

The two chapters, The Integration of the Personality and The Return of the Repressed, are probably the most unsatisfactory in the book. Both are especially difficult to follow and both contain material that may arouse skepticism. For example, " . . . the aggression the child originally felt against his father has become redirected and turned inward against his own ego. This redirected aggression is experienced by the individual as conscience." (144) Again, "Like the dream, the neurotic symptom represents the return of repressed wishes in disguised form." (228) Both of these statements *may* be true, but one is not convinced of it from reading this book.

Although Langer refers in many places to the culture not only as providing the framework for behavior but also as an active force affecting behavior, he does not seem to realize that some of the conflicts from which individuals suffer may be imbedded in the culture itself. He thus even appears to ignore the contributions to this subject made by those whose psychological views are similar to his own, e.g. Karen Horney and Eric Fromm.

Despite the aforementioned deficiencies, the book on the whole is a good one. The chapter on escape mechanisms is masterly and the section on improving one's own adjustment is ingenious. Langer avoids the all-too-common "lift yourself by your bootstraps" approach and makes what appear to be sound suggestions for aiding one's adjustment even when the factors at the root of the trouble are unconscious.

ROBERT C. CHALLMAN
Psychological Laboratories, Norwich State Hospital, Norwich, Conn.

FRY, CLEMENTS C., with the collaboration of Rostow, Edna G. Mental Health in College. New York: The Commonwealth Fund, 1942. Pp. xix+365.

At the present time, there are mental hygiene services in many college communities, but all too often a university psychiatrist is "widely considered a luxury, and in many places a luxury not much sought after." Fry and Rostow contend that too few colleges are willing to assume responsibility for the emotional development of their students by providing psychiatric aid and counsel. Yale University is one of the few. As early as 1925, a mental hygiene service for students was organized there. As may be expected, the program had many changes of heart, of personnel, and of techniques and methods. However, the service hurdled these barriers and exists today as an indication of a need for such an organization. The authors believe that their study "suggests that no college can escape this burden if it wishes to fulfill its educational goal."

Even though the book is described as a "study of case histories," it is unusual to find such a scarcity of statistical material. In the entire book there is only one table and it does not refer to the study. As a result, it is extremely difficult to discover how many and what types of students were treated for mental hygiene problems. Pertinent tables, even though in an appendix, would add much to the book's value. Furthermore, there is neither a bibliography nor any direct reference to other studies or authorities.

As a study of case histories, the book serves its purpose well in clearly showing the university's responsibility toward the emotional development of its students. More than 125 cases are discussed. Each is objectively, yet interestingly written. The book can well be used as a reference by those institutions planning on a mental hygiene service for students.

The book is organized into four parts. Part One, the Introduction, discusses the problem and materials of the study. Family relationships and sexual growth, behavior, and attitudes are treated under Problems of Personality Growth in Part Two. Social adjustment and scholastic adjustment are discussed in Part Three under the title, Reactions to the Undergraduate Environment. Part Four considers special problems found mainly in graduate and professional schools.

Of the 1,257 students who consulted the service, 787 were undergraduates and of these approximately 45% were freshmen. Of all the students interviewed only about 8% were considered to be really "abnormal." One may wonder why a psychiatric service is necessary, when such a small number of cases are classed as abnormal. Dr. Fry states that if psychotic, psychoneurotic, or psychopathic personalities were the only ones ever seen, the division would become little more than a "clearing center where patients are diagnosed and sent elsewhere for treatment. Frank mental disorders cannot be treated in a college; such cases must be hospitalized." One of the best arguments for convincing "die-hards" who are unwilling to see the value of a mental hygiene service lies in the needs of students who do not have "mental disorders." As Dr. Fry indicates, practically all the patients treated were so-called "normal" boys who act at times like "abnormal" boys.

In the inauguration of the mental hygiene service at Yale, the authorities were interested in discovering how best to reach all the students who might need treatment. The various metamorphoses of the program may interest college administrators who now see the need for some type of post-war mental hygiene clinic in their institution. (1) At first, a series of freshman conferences were given by the mental hygiene staff with the hope that students so exposed would come for help when needed. However, the results were not sufficient to continue this method beyond two years. (2) The next method was to give a routine mental hygiene examination as part of the physical health examination to all entering students. This method was discontinued after four years, partly because of failure of the system itself and partly because of staff reductions. Dr. Fry and his colleagues came to the conclusion that students who wanted psychiatric aid would seek it, and those who didn't want it, could not be forced. (3) The program now in force ever since 1932, is seemingly a much more natural and efficient one in that the referrals come from physicians in the Department of University Health, and from deans, counselors, faculty, parents, students, and friends.

Generally speaking, this is a valuable reference work for every person concerned with student personnel. It is necessary to bear in mind, however, that this study is strictly a Yale product, and that what applies for Yale need not apply for any other institution contemplating the organization of a mental hygiene service.

HOWARD E. WILKENING.

Purdue University.

SHAW, CLIFFORD R. & MCKAY, HENRY D. Juvenile delinquency and urban areas. Chicago: University of Chicago Press, 1942. Pp. xxxii +451.

The association of juvenile delinquency with city life, and the existence of delinquency areas in cities, have long been recognized and studied. The present volume, containing data from twenty-one cities, represents a major contribution to this phase of human ecology. The authors do not treat directly with psychological phenomena; nevertheless, the studies hold considerable interest for social psychologists.

The most detailed analysis is made of the city of Chicago—two-fifths of the text being given to a complete study of juvenile delinquency over a period of forty years. The geographical expansion of the city is described, with particular attention given to the differentiation of areas within it: business, industrial, and residential. A variety of data descriptive of this process is presented, including different measures of variation in economic, social, and cultural characteristics. The relation of these data to delinquency figures and rates is demonstrated in many maps, tables, and graphs. The design of the remaining studies is similar, though each is much less extensive in score. There is a minimum of anecdotal and case material.

The authors recognize explicitly a number of the difficulties obstructing scientific analysis of social phenomena, present their data in considerable detail, and point out several qualifying or limiting circumstances. Much use is made of fitted curves, the product-moment correlation coefficient and the correlation ratio. Regression equations and other statistical statements of relationship are limited, however, to the particular sets of data studied.

The concluding chapter contains a brief but provocative statement of interpretation, which turns upon two related generalizations growing from the twenty-one studies in the volume. The authors take the position that "all community characteristics, including delinquency, are products of the operation of general processes more or less common to American cities." (435) They also assert that these processes are determined by a typical pattern of American city growth, which consists of a system of radial expansion, resulting in concentric zones wherein the population is assorted on an income basis. This sorting of the population is held to be an intrinsic feature of the pattern.

The authors make much of the economic factor, apparently because close correspondence between family income level and delinquency rate is a consistent finding of their studies, remaining unchanged when such factors as parental nativity or race are controlled. It is argued that since low income groups contain few of the voluntary institutions for maintaining conventional standards and norms of behavior, the norms and values of the child's social world in such areas are more heterogeneous and less likely to be consistently conventional. Delinquency is, therefore, much more likely to develop. In keeping with their interpretations, the authors discount individualized methods of treatment and emphasize the general community changes which will permit improvement in the economic and social conditions of families in high delinquency areas. They recommend the area project or neighborhood action plan, whereby residents of delinquency areas pool their resources in an effort to improve physical circumstances of the neighborhood, provide recreation for youth, facilitate the programs of schools, and generally increase the intelligent handling of children in the area.

The critical reader might regard the neighborhood action suggested by the authors to counteract delinquency as somewhat superficial, in view of the emphasis on delinquency as a "form of social tradition, inseparable from the life of the community," (436) and the limitations placed by that tradition on the foresight and concern of the participants. Other conclusions may likewise need qualification. The analysis of delinquency, while not violating the data, clearly reaches beyond the data and reflects a broad theory of motivation and learning and of culture transmission not explicitly developed in the study. The study itself, however, merits the close attention of psychologists interested in the influence of broad social forces on the behavior of individuals.

Dale B. Harris

University of Minnesota.

Varnum, Walter C. Psychology in everyday life, 2nd Ed. New York: McGraw-Hill, 1942. Pp. xiv–490.

Several changes and additions have been made in the present edition of this elementary text designed for "nonprofessional students." Two new chapters have been added including an introductory chapter on psychology in "war and peace" and another on meeting personal problems. In other parts of the book fifty additional pages of new material have been added. The author has tried to make this edition timely by relating the material presented to present world events. In this he has done well. Other changes in the text include several excellent new illustrations, a number of new tables, a glossary of technical terms, several new "suggested readings," and the relegation of the chapter on physiological psychology to the appendix.

Although most of the topics are quite adequately presented, the volume does have many shortcomings. The author still favors the laws of *readiness*, *exercise* and *effect* even though the first two have been seriously questioned. He makes sweeping statements with conviction, such as, "Naturally, the more an act is used, the more firmly it becomes entrenched in the system" (214). When discussing methods of learning he extols the merits of the whole method over the part method but makes no mention of the progressive-part method. In his discussion of drives he fails to distinguish between the "resistance" and "obstruction" methods of measuring animal drives. He gives considerable space to the James-Lange theory of emotions, and omits entirely Cannon's thalamic theory. Whereas Watson's study of the emotional behavior of infants is mentioned several times, the more recent work of Pratt, Nelson and Sun is not even listed. In his discussion of the Binet test we read, "The most widely used American translation is the Stanford (University) Revision by Dr. Lewis M. Terman" (269). Either the author is unfamiliar with the more recent Terman-Merrill revision, or he considers it unimportant. Moreover, we are told that IQ "never changes," and that the "most important applications" of intelligence testing are vocational. A classic in mis-statement is: "Since feeblemindedness is inherited, little can be done for the unfortunate individuals in any case" (274).

One can not help being impressed with the fact that the author cites repeatedly experiments that were performed two decades and more ago, and that he eschews the more recent studies that in some cases have superseded those from which he quotes. Unfortunately this text is outstanding for its sins of commission as well as those of omission.

George J. Dudycha.

Ripon College.

NOTES AND NEWS

VIRGINIA VAN DYNE FLEMING of Washington, D. C., died May 5, 1943, of a pulmonary embolus following the birth of a daughter.

Notice of the death of BERTHA M. BOODY of Brookline, Massachusetts on August 21, 1943, has been received.

PI LAMBDA THETA, National Association of Women in Education, announces two awards of $400 each for research on the professional problems of women. Three copies of the final report of the completed research study should be submitted by August 1, 1944. Information concerning awards and the form in which the final report shall be prepared will be furnished upon inquiry to MAY SEAGOE, University of California, Los Angeles, California, who is Chairman of the Committee on Studies and Awards.

PAUL CAMPBELL YOUNG, professor of psychology, Louisiana State University, has been named acting head of the department to serve during the absence of WAYNE DENNIS, who is on duty as a lieutenant (j.g.) in the Navy.

CHARLES ALFRED METZNER, has been appointed instructor in psychology at the George Washington University.

The New York State Teachers College (Buffalo) announces the appointment of OSCAR E. HERTZBERG, professor of psychology, chairman of the department of education, succeeding CHARLES C. ROOT, retired.

G. H. GUNDLACH, has been appointed lecturer in psychology at the University of California (Berkeley).

WOLFGANG KOEHLER, professor of psychology at Swarthmore (Pa.) College, will conduct the graduate course in psychology formerly given at the New School for Social Research (New York City) by the late MAX WERTHEIMER. Professor KOEHLER spoke on "Value in a World of Fact," at a session of the Conference on Methods in Philosophy and the Sciences, held at the New School for Social Research, November 28, 1943.

KARL F. HEISER, director of the laboratory of psychology at Norwich State Hospital, Connecticut, has been appointed research director for the State Public Welfare Council.

JOHN M. MCGINNIS, former head of the department of psychology, Hollins College (Va.), has been appointed to a similar post at Beloit College, (Wis.)

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Psychological Bulletin

PSYCHOLOGY IN CUBA

W. H. D. VERNON
Harvard University

Psychology in Cuba, like psychology in other Latin American countries (**91**), has a history very different from psychology in the United States. It has no status as a separate discipline, and there is no journal given over solely to the publication of psychological data. Psychology is seen as a part of philosophy, sociology and education. Even though general experimental psychology has been taught at the University of Habana*—the center of psychological writing and research—since 1881 (**220**), there was no laboratory for experimental psychology there until 1934.† There were, however, laboratories established earlier for training and research in educational psychology and mental measurement (**39**, **121**). Following is a list of laboratories and clinics with the dates of their establishment:

Laboratories and Clinics for Child Study

- *Laboratorio de Paidología*, School of Education, University of Habana. Established in 1916 by Dr. Aguayo.
- *Laboratorio para el Estudio del Niño*, Habana. Founded in 1919 by Georges Rouma, a Belgian educator, but closed in 1921.
- *Laboratorio de Paidología*, Instituto Cívico Militar in the town of Ciego del Avila. Established 1937.
- *Laboratorio para el Estudio del Niño*, 'Alfredo M. Aguayo' Municipal School, Habana. Established in 1938.

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* The list of psychologists at present teaching at the University of Habana is as follows:

School of Education: Dr. Alfredo M. Aguayo, *Professor Emeritus*, Dra. Aurora García, Dra. Luisa Miguel, Dra. Elena Fernandez, Dr. Luciano R. Martinez, Dr. Diego Gonzales Gutierrez, Dra. Margarita de Armas, Dra. Ana Echegoyen Montalvo, Dra. Piedad Maza.

School of Philosophy and Letters: Dr. Roberto Agramonte, Dr. Ildefonso Bernal del Riesgo, Dra. Inez Seguro Bustamente.

School of Medicine, Nervous and Mental Diseases: Dr. Amando Cordoba, Dr. José R. Valdés Anciano, Dr. Rudolfo J. Gueral González.

† Personal communication from Dr. A. M. Aguayo.

Laboratorio de Psicología Individual, School of Education, University of Habana. Directed by Dr. José M. Gutierrez.

Clínica Psicopedagógica, School of Education, University of Habana. Founded in 1918 by Dr. Aguayo. Now under the direction of Dra. Aurora García.

Clínica de Psicología del Adolescente, School of Education, University of Habana. Under the direction of Dra. Piedad Maza.

Clínica de Investigación Pedagógica, School of Education, University of Habana. Under the direction of Dr. José M. Gutierrez.

Laboratory for Experimental Psychology

Laboratorio de Psicología, Faculty of Philosophy, University of Habana. Established by Dr. Agramonte in 1934.

It is in the field of educational psychology that most thinking and writing has been done. The very early work in this field has been summarized by Morales (**175**), and will therefore not be reviewed here. Of more recent historical importance are the names of Varela and of Luz y Caballero, both of whom, though not psychologists in the modern sense, had sufficient influence on the course of educational development in Cuba to find frequent mention in modern Cuban educational writings. Both of these men, like most of those with whom we shall be concerned, were born in Cuba and were educated at the University of Habana, an institution which since its founding in 1728 has had a great deal of influence on the intellectual life of the country.

Varela (1788–1853), was a priest of the Catholic church, a graduate of the university in Arts and Theology, and in 1811 its first professor of philosophy (**273**). He later held the chairs of Political Economy and Constitutional Law, was elected deputy to the Spanish Cortes under the constitution of 1812 where he championed the cause of Cuban independence. On the repeal of this constitution he came as a refugee to the United States and remained here until his death in Florida. Among his published writings are works in Logic and Metaphysics, and in Ethics (**273**), in Natural and Biological Sciences (**215**), on Astronomy and on Constitutional Law (**178**).

Varela's influence on educational matters in Cuba stems from his philosophical point of view. His theory of knowledge is related to that of Locke and Condillac and also the thought of Destutt de Tracy which had a transitory vogue in Europe at that time (**100**). The educational reforms initiated by him were such as to attack and destroy classical methods of teaching which placed great emphasis on the parrot-like use of the memory, and in their place to encourage the use of methods stressing actual experience, the use of reason, and a full understanding of material learned. He thus introduced what became known as the "explanatory method" (**125**). The high regard with which, even today, Varela and his contribution to education in Cuba are regarded may be gained both from the number of writings on his life and work (**12**, **100**, **125**, **174**, **177**, **178**, **192**, **197**, **233**, **238**, **262**), and from such a quotation as the following, taken by a recent author (**266**) from the writings of Luz y Caballero, who carried on Varela's reforms: "As long as thinking continues in the island of Cuba we will think with veneration and feeling of him who first taught us to think."

Luz y Caballero (1800–1862), a graduate of the University of Habana in Arts and Law, took over the chair of philosophy when Saco, Varela's successor, left Cuba (**273**). Caballero was also a priest of the Catholic church, but abandoned an ecclesiastical career when he found himself at odds with the church over certain matters of doctrine (**194**). In 1828 he travelled extensively in the United States, Great Britain and Europe. He studied with Cuvier in France and von Humboldt in Germany. On his return he set to work to reform primary education along the lines on which Varela had reformed secondary education. In 1833 he published *A Text of Graduated Readings for the Practice of the Explanatory Method* (**138**). "The explanatory method," says Sanguily, Caballero's biographer (**201**, **202**), "reduces itself to making the students reflect upon all they read, explaining it to them word for word as far as is necessary for the understanding of the treatise" (**201**). Like his predecessor he proposed to do away with mechanical teaching, to combat the exaggerated use of memorizing and to cultivate the child's use of his own language, both spoken and written (**211**), a point of view undoubtedly influenced by his philosophical position which reflected the thinking of John Locke, and English sensationism generally (**201**). Caballero also founded El Salvador College, proposed the creation of public libraries, and reported on the need for teaching mathematics, drawing, physics, chemistry and modern languages (**201**). Besides his lectures (**139**), an interesting source of information on what Caballero taught his students is the examinations which he gave them and which have fortunately been preserved (**141**, **143**) (**144**). Some of his thoughts on education can be found in (**137**, **142**) and his own discussion of the explanatory method in (**145**). Others, besides Sanguily, who have written of his life and work are (**194**, **196**, **211**, **237**).

There are other names which are of historical importance in the field of educational advance and we call attention particularly to three, Dolz (**71**), Echemendia (**70**, **71**, **110**), and Heredia (**260**).

Psychology, as the word is understood in the United States, begins with Varona (1849–1933). But it is incorrect, nevertheless, to speak of Varona as a psychologist, for that would be to limit an encyclopaedic as well as abundantly creative mind to one small field. Varona was a philologist, poet, writer, orator, and philosopher as well as a psychologist. He was professor of philosophy in the university from 1880 to

1915, honorary Dean of the Faculty of Letters & Sciences, Secretary of Public Instruction during the period of the American administration in Cuba, and at one time the vice-president of the Republic and chief of the Conservative party. He was also the editor of the *Revista Cubana* (273).

In his capacity as professor of philosophy Varona began, in 1881, to deliver lectures to his students on modern psychology, and these appeared in print, in that and the following years, in the *Revista Cubana* under the title of *Conferencias Filosóficas* (**220**), and later in (**227**, **234**, **253**, **254**, **258**, **261**). Herbert Spencer and Locke were the formative influences in Varona's thought, but his psychological writings and critical reviews of the psychological writings of his contemporaries (**217**, **221**, **222**, **223**, **224**, **225**, **226**, **228**, **232**, **235**, **263**) show wide reading and comprehension of English, French, German and American psychology. Agramonte, Varona's successor, in a recent work outlining the latter's thought (**10**), writes of him as conceiving psychology to be the study of both organic and functional mental phenomena. When subjective phenomena reach their clearest form they, according to Varona, constitute consciousness, and their phenomenal succession integrates the states of consciousness. In methodology Varona was an eclectic, using introspection with proper caution, but also taking account of the physical accompaniment of every mental process.

Though he was versed in scientific psychology and gave it due place both in his *Conferencias* (**218**, **219**, **231**), and elsewhere as we have shown, Varona, in a day when psychology aimed at being a pure science, followed in the tradition of his own countrymen, and felt no compunction in concerning himself with the more practical aspects of applied psychology. He was particularly concerned with education, popular (**240**) and private (**245**), physical (**250**) and social (**244**), the examination system (**236**, **247**, **248**), teaching (**239**), secondary education for girls (**229**), delinquency (**251**) and school hygiene (**216**). He was concerned with various practical aspects of educational policy (**249**, **252**, **255**) as well as the larger problem of educational freedom (**230**). During his tenure as Secretary of Public Instruction he made a survey of the condition of Cuban education (**242**, **243**) which led to certain important reforms which still bear fruit (**273**). Accounts of Varona's life and works may be found in (**5**, **10**, **68**, **71**, **270**).

In 1916 Dr. Sergio Cuevas y Zequira succeeded to Varona's position and was followed in 1925 by Dr. Salvador y Massip. Massip's writings show an interest particularly in various aspects of child psychology (**147**, **148**, **152**), and in clinical psychology (**149**, **151**). He has also written on secondary education (**153**) and on memory (**150**).

In 1926 Dr. Roberto Agramonte (1904–) succeeded Salvador y Massip, and became head of the department of Psychology, Sociology and Ethics. Agramonte, a graduate of the University, had received from it the Doctorate in Civil Law in 1924, and in Philosophy & Letters in the same year. After study in the United States at Columbia University he had been appointed assistant professor of the History and Philosophy of Sciences in 1925.

Agramonte has carried on an energetic and productive program. It was under his direction that the first laboratory in experimental psychology proper, duly recognized as such, was organized in 1934, though there is evidence that, like James,* Varona directed an informal laboratory as a supplement to his lectures.† Since 1932 he has published regularly in his three chosen fields Psychology (**1**, **2**, **3**, **4**, **6**, **8**, **15**, **16**), Sociology (**7**, **9**, **13**), and Philosophy (**5**, **10**, **11**). He has applied his knowledge to the writing of biography (**6**, **7**) and to education (**14**).

Agramonte's *General Psychology* (**16**) covers a somewhat wider range of topics than is usually found in any one comparable American text. It gives evidence both of continuity with the psychology of Varona and of a wide knowledge of American and European psychology. Agramonte's psychology is a behaviorism, but not a radical behaviorism; it is concerned with the dynamics of reaction, but is wider in scope than a mere reflexology as it aims to bring within its boundaries all mental processes and personality. His *Briefer Psychology* (**15**), which is especially designed for use in Normal Schools, is a very American looking book both in its format and illustrations, and its content based on the larger work should prove very stimulating and useful to the teacher in training.

True to the tradition of his predecessor, Agramonte shows a variety of talents. His *Biography of García Moreno* (**6**) is an interesting example of what can be done in the way of applying psychological knowledge to the interpretation of historical data, and his writings in general show an interest in practical application. As Vice-Rector of the university, he also finds outlet for administrative talents.

The traditional interest in educational psychology displayed by Varela and Luz y Caballero has been continued by Dr. A. M. Aguayo (1866–). In 1906 Aguayo became assistant to Dr. R. Meza y Suarez Ilcan in the School of Education of the University of Habana. He succeeded to full professorship in 1912 and was appointed head of the department in 1925. A Licentiate in Law and Doctor of Pedagogy of the university, he had had practical experience in the educational world as Director of Schools of the Province of Habana (1901–1906) before coming to the university position.

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* Cf. Boring, E. G., *A History of Experimental Psychology*, New York: Appleton-Century, 1929.

† I am indebted to Dr. Lasaga of the University of Habana for this information.

Some idea of the range of Aguayo's thought and writing, and of his point of view, may be gained from a brief survey of three of his publications, *Scientific Pedagogy* (60), *Philosophy & New Points of View in Education* (66), and *Pedagogy in the New School* (65). *Scientific Pedagogy* is divided into two parts, the first concerned with the general problems of learning, and the second with the learning of specific school subjects. The first part takes up such topics as the nature of learning, methods of investigating the nature of learning, statistical methods, motivation, the curve of learning, transfer, retention and forgetting, techniques of memorization, thought, motor learning and so on. In the second part the learning of reading, writing, arithmetic and certain other subjects are considered. The bibliographical references are mostly to American writings, though European writers are also represented both in translation and the original. The earliest reference is to the *Principles* of William James, the latest to the work of a Cuban author published in 1930. Such well known texts as those of Gates, Jordan and Pintner are constantly referred to. Thorndike is perhaps the author most often cited. The book concludes with a discussion of achievement tests and a brief chapter on personality.

Philosophy & New Points of View in Education also consists of two parts. The first is concerned with such topics as the concept, function and values of education, the student, freedom and discipline, the school, the teacher, and a final chapter on the philosophy of method. The second part is a discussion of modern educational methods from Froebel and Herbart to progressive education in the United States. The contribution of workers in various countries is reviewed, and in a final chapter the principles common to them all are brought together in a synthesis.

Pedagogy in the New Schools applies the principles discussed in the previous work to the actual problems of the class room. The first fourteen chapters discuss various types of class room procedure, such as the project method, learning through play, the directed study, etc., while the remaining sixteen chapters discuss the learning of specific subjects from Natural History to Manual Training. In this area there is some overlap with the topics discussed toward the end of *Scientific Pedagogy*, but it is slight and in any case they get a more extended treatment in the text under consideration.

These three works are but a small sample of Aguayo's publications. A survey of the items listed under his name in the accompanying bibliography shows the following distribution: Texts on various aspects of education (51, 54, 58, 60, 65, 66, 72, 74, 77), intelligence and mental measurement (22, 23, 25, 26, 42, 48, 49, 50, 57), history of education (27, 28, 38, 46, 68, 70, 71), higher education (19, 20, 45, 62, 63), philosophy of education (41, 69, 75, 76), child development (32, 33, 35, 36), language (21, 43, 44), method (17, 64, 78), theoretical (24, 30), primary education (29, 36), motivation and learning (59), secondary education (18), suggestion (53), sensation (52), memory (61), and unclassified (34, 40, 47, 55, 67, 73).

Although Aguayo's energies have been chiefly engaged in the exposition and application of the psychology of education he has not neglected clinical study and educational experiment. Although not the first, Rodriguez had founded in 1886 in connection with the *Instituto de Hoyo y Junco* a pedagogical clinic (121), Aguayo was one of the first to recognize the importance of experimental study, founding at the university in 1912 the *Laboratory for Child Study*, and later in 1918 the *Psychoeducational Clinic* (121). Aguayo is now retired from active teaching. As Professor Emeritus he may be considered the Dean of Cuban educational psychology.

Finally, the work of three other psychologists, Dr. Bernal del Riesgo, Dr. Piedad Maza and Dr. Aurora García, merit consideration. Dr. Bernal after receiving his degree from the University of Habana spent two semesters studying in Vienna in 1931–32. In the following year he was appointed to the staff of the School of Education, and in 1937 was transferred to the School of Philosophy & Letters to teach General Psychology. Dr. Bernal's chief publication to date is a short *Introduction to Psychology* (95), which is a modern, eclectic, middle of the way, American psychology with the very familiar illustrations of an American text. His other publications concern thought (93), examinations (94), and a review of Agramonte's Sociology (96). Dr. Bernal is at present director of *Hora Docente* and *Guía*, two educational publications, and representative in Cuba of the New Education Fellowship,

Dr. Maza (1901–   ) received the Doctorate of Education from the University of Habana in 1923 and the Doctorate of Philosophy from the same university in 1926. After experience as a teacher in the Habana Normal School she was appointed professor in the School of Education in 1934. Since that time, she has specialized particularly both in her teaching and research in the field of adolescent psychology, and is director of the *Clinic of the Psychology of Adolescence*. The theoretical orientation of Dr. Maza's writings is eclectic, and in their intent they are practical. An attempt is made to understand the psychology of the Cuban adolescent in such a way as to assist in the setting up of a program of secondary education which will fit his needs. Such an attempt is exemplified in the research reported in *Psicología del Adolescente Cubano* (161), which reports the needs and life goals of a sample of Cuban adolescents. Other aspects of adolescence are considered in (156, 158, 159), and the remaining publications concern secondary education (160), philosophy of education (157) and history of education (155).

Dr. Aurora García, director of the *Psychoeducational Clinic* and professor in the Faculty of Education, was appointed to the staff of that faculty in 1933. After a year of post-doctorate study in the United States, she has recently returned to Cuba. Dr. García's most important publication to date is her *Educational Psychology* (121). This book is the most theoretically minded, the most historically oriented, and best documented work so far reviewed. It might well be called *A Comparative Psychology of Education,* for it takes pains to lay side by side, frequently in tabular form, the conflicting theories on a variety of important topics in the fields of child and educational psychology. The book begins with a brief discussion of the relation of educational psychology to other branches of psychology, moves into a discussion of the historical development of the field, the methods employed in child study and the influence of schools of psychology. Following a discussion of the influence of the concept of evolution in educational psychology, the topics considered are, learned and unlearned behavior, play, imitation, emotional behavior, the conditional response and emotion, intelligent behavior, the nature of learning, laws and theories of learning and curves of learning. Dr. García's other writings pertain to the psychoeducational clinic (117), learning to write (118), the problem of illiteracy and its solution (119), and Tolstoy's educational methods (122).

This review of Cuban psychology would be incomplete if the great number of occasional writings on psychological topics scattered through a variety of journals were not mentioned. The greatest number concern problems of the psychopathological and subnormal (111, 128, 129, 130, 133, 166, 167, 168, 188, 199, 210, 214). The problem of instincts and instinctive behavior has been of much interest (81, 88, 105, 176, 185, 200, 265, 271), and educational methods and systems (82, 87, 92, 169, 191, 195, 204, 205), as well as topics in the philosophy of education (86, 110, 162, 184, 207, 208) have received attention. Other topics of interest have been suggestion and hypnosis (109, 115, 163, 164), psychoanalysis (116, 186, 187), consciousness and unconsciousness (102, 213, 269), tests and measures of intelligence (99, 106, 107), intuition (123, 124), behaviorism (84, 190, 271), memory (173, 180), attention (112, 182), animal and experimental (90, 154, 165), child (104, 113, 114, 193, 198, 263), mental hygiene (79, 187), speech and language (103, 134), primary schools (83, 206), exceptional children (181), sensation (101), philosophical (85), and a variety of miscellaneous topics (80, 89, 126, 127, 135, 136, 169, 170, 171, 183, 209, 212, 267).

Looking over this survey we may say that the research of Cuban psychologists has been chiefly practical in nature. The early Cuban Philosopher-Psychologists were mainly concerned with developing better pedagogical methods, and educational psychology still remains the primary concern of their more experimentally inclined successors. It is therefore in this field that most of the original contributions of modern Cuban psychologists are to be found. However, as educational psychology is in Cuba highly integrated with general psychology, interest naturally extends into this wider field, although this extension of interest manifests itself in scholarliness and sophistication rather than in experimental investigation.

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* The author is indebted to Señor Jorge Aguayo of the University of Habana Library for his assistance in collecting this bibliography and to the members of the departments of Psychology and Education who have sent him information as well as copies of their books and articles.

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PSYCHOLOGICAL EFFECTS OF THE MENSTRUAL CYCLE ON WOMEN WORKERS

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Today when women are playing an increasingly important part in winning the war, the question of their reputed biological handicaps becomes especially pertinent. Not only is it important for an evaluation of their status during the present emergency, but it also bears directly on the problem of their role in the postwar era. Fortunately scientific data concerning menstrual cycle effects have been gradually dispelling the ignorance and superstitition formerly associated with this function (26, 55), and have given us a clear understanding of the nature and effects of the essentially feminine functions. We can now estimate with high accuracy their effect or lack of effect on the contributions society may expect from its women.

SCIENTIFIC EVIDENCE

Onset and Physiology. Between the ages of 13 and 14 years, girls in our culture experience their first menstruation (**10**, **18**, **42**). Far from exerting the traumatic influence often attributed to it, this new function is usually accepted naturally and even with a feeling of pride unless there has been inadequate preparation (**14**, **40**, **68**). The appearance of the menses heralds the sequence of endocrine changes associated with the maturing of successive ova. Menstruation represents one of four clearly demarcated phases of the ovarian cycle (**52**), and unless fertilization takes place, it recurs at modal intervals of 28 days (**4**, **18**, **31**). Deviation around this mode is the rule, with the distribution of cycle lengths following the normal curve (**1**, **4**, **8**, **18**, **20**, **25**, **29**, **31**, **33**, **63**). Correlated with the hormonal changes are cyclic variations in such physiological processes as temperature, basal metabolic rate, and less clearly, blood pressure (**5**, **56**, **57**, **60**, **62**, **67**). There is also some evidence of a premenstrual rise followed by a menstrual fall in muscle strength and a preovulatory peak in motor activity (**7**, **60**).

Performance Effects. Of crucial significance for industry is the question of menstrual cycle effects on performance. In considering this question it is necessary at the outset to differentiate between biological and cultural effects. We must determine to what extent a given change represents an intrinsic correlate of the menstrual function *per se*, and to what extent it merely reflects traditional expectation. Experimental studies using objective measures have revealed few changes that can be unequivocably attributed to the menstrual cycle. This is especially true of such relatively simple tasks as tapping and color naming. At this level it would obviously be an easy matter to compensate for any unfavorable conditions by exerting a little extra effort. When the task complexity is increased, however, compensatory mechanisms would be strained to the point of collapse and we should expect adverse effects to break through to performance. The recent scientific evidence fails to support this hypothesis. It is true that early studies of processes involving choice reaction time, learning, concentration of attention and persistence suggested a diminution of capacity in correlation with the menstrual phase (**60**). Later investigations using equally taxing problems, but more adequate controls, have generally produced negative results (**35**, **43**, **44**).

Related to the question of performance stability is the question of stability of response to disturbing stimuli. To test this, the writer confronted a group of normal subjects daily with intense electric shocks and measured a variety of reactions representing different levels of voluntary control. Analysis of the women's scores failed to reveal any significant differences from analogous data obtained from a control group of men (**61**).

Subjective Feelings. When we turn to studies which depend on subjective responses—mood ratings, questionnaires, diaries, interviews and the like—a very different picture appears. Cyclic variation is now consistently reported. The premenstrual phase is one of accelerated mental and physical exertion coupled with high tension and irritability (**2**, **14**, **45**). Menstruation is accompanied by fatigue and a depressive reaction with introversive tendencies (**14**, **16**, **26**, **45**). Some investigators have reported confirmation of the mid-menstrual activity peak mentioned above, which seems to be characterized by elation (**2**). In subjective material of this sort, it is difficult to estimate the role played by suggestion. Social tradition has set such a negative value on menstruation that women regard it as "the curse" and are led to expect unpleasant effects on mood and behavior. It would be enlightening to see whether "the sign could be changed" in a society that removed negative values from this function. In the absence of such a control we can only present the findings at our disposal, emphasizing the fact that these subjective changes are not correlated with performance.

INDUSTRIAL APPLICATIONS

Effects on Production. With female employment in essential war industries at an unprecedented peak, the question of possible menstrual effects becomes acute. Despite its importance, however, there is unfortunately little direct information on this pressing problem. On the basis of the experimental results on test performances we should expect little change in industrial performance. The available data, however, are inconclusive, and opinion varies. In the early thirties the International Labour Office at Geneva stressed evidence suggesting a diminished output (72). During the same period, the Institute of the Science of Labour in Japan reported a study of 110 women employed in spinning mills, cigarette and clothing factories. Some decrease in efficiency appeared in association with the menstrual period in the majority of cases, but wide individual differences prevented generalization as to exact time relationships. Moreover, the finding loses point because the magnitude of the menstrual decrement did not significantly exceed the average daily deviations (38). A later prewar study on 80 women working in an electromechanical factory in Kharkov, showed little variation in output although there seemed to be an increased susceptibility to fatigue and work pauses were prolonged. The authors attribute the minor character of menstrual effects to the favorable working conditions in Soviet industry (28). Since the outbreak of hostilities Anderson cites a study of women by the British Health Research Board which indicated no consistent menstrual cycle effects on output, and she points out that menstruation is not disabling to most women (3). At the present time there is unusual need as well as unusual opportunity for further work along this line.

Absenteeism of Women Workers. Most of the material bearing on the problem of industrial production is derived from statistics on absenteeism. In general, women workers appear at a great disadvantage in this respect when compared with men (32). Before branding them as the "weaker sex," it is necessary to determine how much of their absenteeism is due to factors intrinsically associated with sex, and how much is socially conditioned. There seems to be little doubt that a large share may be attributed to the double burden of old domestic and new industrial responsibilities. In such cases the remedy is clearly a matter for social reconstruction. Another important determinant is illness. That woman's sickness absenteeism greatly exceeds that of the male worker is clearly indicated by the available statistics. Gafafer estimated that from 1936 to 1941, the frequency among women was approximately 60% higher than that among men (22, 23). This trend has been repeatedly confirmed by other investigators. Brinton and Seifert found a similar sex difference in their survey of over 10,000 employees in soap industries during 1938 and 1939 (12). Again, an extensive study covering 9,000 families in 18 states made by the Committee on the Cost of Medical Care and the U. S. Public Health Service brought out the same general result (15).

That the excess of female over male illness was not confined to a comparison of *workers* was revealed in the recent National Health

Survey. The rate for housewives was 47% greater than that for women workers even when specifically female disorders were excluded (**30**). The facts indicated by all these studies are clear enough, but their interpretation is equivocal. In view of women's apparently better resistance to certain groups of leading diseases, e.g. pneumonia, heart trouble and most forms of cancer (**23**), it seems unlikely that the higher sickness incidence is a sign of biological inferiority. It seems more in keeping with cultural tradition that they have taken advantage of the more sheltered role society has allotted them and given in more readily to symptoms of minor disability. Because of external necessities, working women have done so less than housewives although they have not yet accepted the higher male standards of reliability.

When we include disorders peculiar to women the discrepancy between the sexes widens. Superficially this suggests a biological explanation but as we have repeatedly noted, cultural expectations influence women's attitudes toward their biological functions in the direction of invalidism and may account in large part for absenteeism mistakenly attributed to normal reproductive processes. Although our discussion must be limited to the menstrual cycle, many of the conclusions are equally applicable to other female sex functions, notably, the menopause, pregnancy and lactation.

Extent of Menstrual "Handicaps." Although for centuries women have been exploited as cheap labor, society has continued to assume a paternalistic attitude toward them, emphasizing their "need" for special protection. These protective devices actually have "protected" only economic inequalities between the sexes, justified on the assumption of biological inequalities. One of the first scientific attacks on the notion of menstrual incapacitation may be found in Jacobi's prize essay published in 1876 on "the question of rest for women during menstruation." Using an anonymous questionnaire method the author found that in 35% of those replying, menstruation was not accompanied by pain or weakness; in 46% there was mild discomfort and in 17%, severe pain. Freedom from menstrual disturbance was related to such factors as amount of exercise and regularity of occupation. Jacobi concluded that existing menstrual pathology is due to faulty physical education of women and the unfavorable conditions of their employment. In view of Victorian manners and mores it perhaps goes without saying that faulty psychological attitudes contributed no small share of the difficulty. According to Jacobi there is nothing in the nature of menstruation to imply the necessity or even the desirability of rest (**37**).

As women in our culture participate more and more in the work-a-day world and live more healthful and satisfying lives we should expect the incidence of dysmenorrhea to decline. This is indeed the general trend. Reviewing a number of investigations conducted before

World War I, Novak reported that the vast majority of women workers included in these studies suffered little or no menstrual discomfort, while the percentage of those who were incapacitated was negligible (**50**). In spite of this hopeful record, menstrual absenteeism has always presented a serious industrial problem. Thus, disabilities of three days' duration or less, were found to account for 54% of all absences among men, and 66% of those of women as recorded by the U. S. Public Health Service (**41**). The higher female percentage is presumably weighted by dysmenorrhea. In 1919, Mock of Sears Roebuck reported dysmenorrhea to rank second among the causes of female absenteeism, occurring in 18.9% of 2935 industrial employees (**17**, **49**). This figure may have been unduly elevated because of war conditions. Meaker's analysis of the records of four large industries, published in 1922 revealed a somewhat lower frequency. On the average a little over 10% of female employees sought relief for menstrual disabilities during a month, dysmenorrhea accounting for 0.1% of the total absenteeism (**47**).

The records of the Boston Edison Company enable us to make some long-range comparisons which we may summarize as follows (**13**, **21**, **24**):

Date	*Investigators*	*Ann. No. Absences per 1000 Women*	*Ann. No. Days per Woman*	*Ann. No. Days per Absence*
1915–1924	Brundage	306.0	0.750	—
*1933–1937	Gafafer & Frasier	129.8	0.210	1.63
1937–1941	Gafafer	123.6	0.294	2.38

* Averages of two comparable groups, clerks and typist-stenographers.

The marked drop in incidence of dysmenorrhea from the earliest to the middle period may in part represent improved working conditions inasmuch as the first period included the war years with their increased and unaccustomed employment of women. The most recent figures, though showing little change in actual incidence, do indicate increased length of menstrual absences. The influx of women workers again, following an interval of low turnover, together with the recurrence of war strain, may be responsible for any recent increases.[1] We may hope that a change in menstrual mores will prevent present tendencies from reaching former heights.

In the quarter of a century since the first World War, accumulating industrial experience has shown a general downward trend in menstrual disturbances. In 1923, Sturgis reported that of over 2000 women employed in a large department store, only 4.4% were seriously handicapped by dysmenorrhea. Another 26.3% were somewhat less efficient as a result of discomfort but this was largely functional and yielded promptly to education in proper physical and mental hygiene. In view of the small time loss attributable to periodic disabilities the author concluded that the incapacitation of menstrual cripples should not be charged against the great majority of working women (64).

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[1] Noel G. Monroe, M.D., Medical Director, Personal Communication.

The importance of education is brought out in Ewing's tables, compiled on over 7000 clerks of the Metropolitan Life Insurance Company, covering a period of 6 years (**19**, p. 249):

Average Number of Days Lost and Average Number of Visits to Rest Rooms per Month per 100 Female Employees because of Dysmenorrhea

July to Dec.	*No. Days Lost*	*No. Visits to Rest Rooms*
1924	3.0	7.1
1925	2.5	7.2
1926	2.6	5.5
1927	2.1	4.9
→1928	1.3	3.3
1929	1.0	2.9
1930	0.6	2.3

From 1926 on, when medical treatment was instituted for severe cases a steady reduction in menstrual handicap appears. The most significant change comes, however, in 1928 when a concentrated study with careful checks on time out, was started. A special program of exercises was developed, resulting in improvement in 89% of the records (**19**). Dublin reports that a more recent follow-up by the Medical Department shows a decrease of 75% in number of days lost from 1928 through 1934 and a decrease in number of visits to rest rooms of 44%.[2]

Another large life insurance company has recently reported a marked decline in menstrual absenteeism as a result of systematic examination of all absentees, coupled with the discontinuation of pay after a limited time allowance. According to Percival, of 950 women employees only 3 lose as much as one day per month because of dysmenorrhea. In certain other cases short recess periods may be necessary. These results are in striking contrast to previous records when over 100 girls were away regularly. The author stresses motivation as the essential factor responsible for the change rather than the medical treatment as such. Before the intensive check-ups, it was a temptation for a woman to indulge in a bit of socially acceptable malingering by taking advantage of the popular stereotype of menstrual incapacitation (**53**).

The role of psychogenic factors in the control of menstrual disabilities is increasingly recognized. For example, Watson of the American Telephone and Telegraph Company finds that dysmenorrhea does not contribute importantly to absence from or interference with work. He attributes this good showing to a progressive program aimed at inducing healthy psychological attitudes toward menstruation.[3] In similar vein Burnell reports a reduction of 80% in menstrual absenteeism at the AC Spark Plug Division of General Motors coincident with the introduction of a well-rounded hygiene clinic which includes simple medication and exercises for cases of distress. This is supplemented by the Induction School where new employees learn that menstruation does not constitute an excuse for absence.[4] Vultee Consolidated Aircraft Corporation reports great success with special exercises but the medical director is inclined to credit the psychological effects of the exercises as much as the exercises themselves.[5] In a psychosomatic process like menstruation it is difficult to isolate physiological from psychological variables. Consequently any systematic therapeutic program which concentrates attention on the employee is bound to have reverberations on morale. We might add the experience of many other industries to our list, but the point repeatedly emphasized in all cases of successful handling of the problem of menstrual absenteeism is that wherever the employees have been convinced that the management can help them, improvement follows regardless of the specific method of treatment.

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[2] L. I. Dublin, 3rd Vice-Pres. and Statistician, Personal Communication.

Menstrual Health and Occupation. When we compare occupations we find conspicuous differences in menstrual health. The factors chiefly responsible for the differentiation are physical activity and motivation. The role of exercise comes out clearly in a study of 14,000 members of the WAAF, which represents a cross-section of various trades. The more active groups such as balloon operators, fabric workers and cooks, suffered appreciably less from dysmenorrhea than the more sedentary telephonists, teleprinters, clerks and others (71). When exercise involves strain, however, it is likely to have unfavorable effects on the menstrual function. Prolonged sitting or standing as in the case of sewing machine operators and ironers, may accentuate or even induce menstrual disorders (72).

Further light is thrown on the effect of exercise by studies of women athletes which indicate that strenuous sports are not harmful to the menstrual function provided that the women are habituated to their performance. On the basis of an extensive investigation on physical education students, sports teachers and athletic contestants, Vogt reported that not only were the sports continued throughout the flow by the majority but that dysmenorrhea was thereby improved (66). Wittich found that of 238 participants in a sports festival, 82% experienced no change in menstrual functioning (69). Similarly Peregrino's and Oliveira's analysis of the menstrual records of 55 members of the National School for physical education and sports in Brazil showed the majority unchanged by the training. Moreover, the pursuit of the sports including swimming during the flow had no unfavorable repercussions if the women were used to them (54). Skirlj injects a dissenting note into the otherwise consistent picture. A statistical study of 153 girls at the Warsaw Institute for Physical Education seemed to indicate a relationship between dysmenorrhea and swimming, skiing and other strenuous activities, The author admonishes against indulgence in the more violent forms of exercise during the flow (63). The fact that these results differ so from those previously cited suggests that the subjects may not have been sufficiently seasoned to the sport and that the consequent strain was responsible for the unfavorable effects. Further data are needed before a final answer can be given but the weight of present evidence is in the direction of continuing during menstruation whatever activities are customary at other times (11).

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[3] Cassius Watson, M.D., Medical Director, Personal Communication.

[4] Max Burnell, M.D., Medical Director, Personal Communication.

[5] A. C. Dick, M.D., Medical Director, Personal Communication.

Closely related to women athletes are professional dancers. Morale as well as physical exertion plays a conspicuous part here and the fusion of these two factors is responsible for the best records. For example, the manager of a large and celebrated dance group finds dysmenorrhea negligible. The exercise itself is helpful and presumably accounts for the easier childbirth many of the team have experienced. The stage discipline and tradition that "the play must go on" are important supplements to physical exercise.[6]

Another exacting occupation demanding high morale as well as physical exertion is flying. A study made by a flight surgeon based on questionnaire responses from women endurance and racing pilots showed that those who were not usually subject to menstrual disturbances experienced no ill effects while flying during the period. The investigator pointed out that practically all the medical authorities whom he consulted admitted no reason why women who were healthy should refrain from flying during menstruation (34). In the light of this evidence it is surprising indeed that aviation medical examiners should be instructed to caution all women against flying within a period from 3 days prior to 3 days after the flow (39).

Similar considerations may be applied to nursing, a profession which again combines physical activity with a sporting tradition. In a group of 250 student nurses in a large hospital, Percival found that on the average only one nurse per month went off duty because of dysmenorrhea (53). Among 600 nurses at the New York Hospital, the proportion is slightly higher—7 nurses losing a total of 7 days during the period from July 1, 1942 to February 1, 1943. Unfortunately these figures can be regarded only as approximations because they do not include nurses living outside the residence, nor do they take account of cases incapacitated for a few hours during their free time. Nevertheless the fact remains that the authorities in the nursing services do not find menstruation a handicap to their nurses.[7]

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[6] Russell Markert, Manager, "Rockettes," Music Hall, Radio City, New York.

Boynton's study of the menstrual histories of more than 2000 university women is of particular interest because it compares students in general with student nurses. She reported that while the student group showed a 20% incidence of dysmenorrhea, in the special group of student nurses it was only 7%. Although selective factors possibly making for greater health and vigor in the nursing group were not controlled, the author attributed their better showing to greater regularity of living and physical exercise (**9**). Perhaps the most important ingredient of all was morale. The less motivated college students may have exploited their "cramps" as an escape from responsibility.

EDUCATIONAL EFFECTS

Throughout our discussion we have noted the importance of attitude in the control of dysmenorrhea. Since the experience of discomfort is subjective, reports of *absolute* incidence are bound to vary, but they are consistent in indicating a *relative* decrease after the institution of some program of treatment. Parallel with industrial findings are the results obtained in schools and colleges. Thus in 1920, Meredith found only 17% of 749 Wellesley students complaining of menstrual difficulties as compared with 75% a decade previously. The author attributed the striking decline primarily to an improved attitude and secondarily to increased physical activity (**48**). These results were later confirmed by Van Duyne at Goucher. Using Sturgis's method of scaling degree of menstrual disability, she presented the following figures covering three periods in the history of the college:

Date	*No. Students*	*No Handicap*	*Slight Handicap*	*Severe Handicap*
1900–1907	533	62.6	30.3	7.1
1917–1923	1516	74.0	23.0	3.0
1923–1924	1023	86.6	13.1	0.3.

In interpreting this progressive advance toward normality, Van Duyne considered it largely a function of a more sensible attitude on the part of both mothers and daughters, or as she put it, "a stiffening of backbone rather than of abdominal muscles." (**65**).

About the time of Van Duyne's study, Sanderson Clow presented her widely cited and provocative investigation of dysmenorrhea among secondary school and teachers college students in England. She found a reduction of approximately 75% in this disorder from an entrance to an exit interview. This she attributed to the normalizing environment of the institutions where the students were expected to participate in the customary games and exercises regardless of menstrual phase. In her opinion, if all employers of female labor were to refuse leaves of absence for menstrual disabilities, the benefits to the majority would compensate for any hardships to the few menstrual invalids (58).

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[7] Harriet Frost, Assoc. Dir., Sch. of Nursing, New York Hosp., Personal Communication.

The very recent educational program in the Los Angeles City Schools fully supports the results of these earlier experiments (27).

These citations though by no means exhaustive, may suffice to demonstrate the importance of psychogenic factors in the control of dysmenorrhea among *normal* women. This does not mean as some have been quick to point out (6) that an improved attitude is the whole story and will categorically cure all forms of the disorder. Psychotherapy must often be combined with exercises, drugs and even surgery. Dysmenorrhea is a symptom which may indicate a variety of abnormal conditions, from cancer to neurosis (32, 36, 46). The results which we have summarized do mean, however, that among healthy women rather than gynecological patients, dysmenorrhea is usually functional and can be greatly improved without benefit of medication. It often appears against a background of childhood maladjustment, persistence of dependency longings or rejection of the feminine role (70), and it may represent an escape into illness from school, vocational or marital responsibilities (46). In any case, it is merely a symptom and effective treatment must get at underlying causes in the total personality. The development of healthy attitudes toward the menstrual function can best be attained through a broad program of sex education begun in childhood and directed toward healthy psychosexual development as a whole (51, 59).

CONCLUSIONS

Our survey of available evidence shows the menstrual cycle to have little effect on the woman worker. Laboratory studies indicate that what effects exist are of a subjective character, reflecting a tradition that views the female sex functions with suspicion and disfavor. Objective performance fails to reveal the expected cyclic changes. The persistence of a code of menstrual invalidism, however, has contributed to industrial absenteeism. Recognition of the increasing need for women workers both by industry and by the women themselves is causing a rapid shift in menstrual mores and a realization that female biology in no way makes for inferiority. An understanding that any activity that may be performed with impunity at other times may be performed with equal impunity during menstruation should go far toward a re-evaluation of women's role in society and should free them from the cultural burden of invalidism and enable them confidently to assume their places beside men in the work of the world.

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(Clow—see Sanderson)

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PSYCHOLOGY AND THE WAR

Edited by

DONALD G. MARQUIS

CONTENTS

HISTORY, ORGANIZATION, AND PROCEDURES, PSYCHOLOGICAL RESEARCH UNIT No. 1., Army Air Forces by *Staff PRU No. 1* . . . 103
SOCIAL PSYCHOLOGISTS IN NATIONAL WAR AGENCIES by *Donald G. Marquis* 115

HISTORY, ORGANIZATION, AND PROCEDURES PSYCHOLOGICAL RESEARCH UNIT NO. 1, ARMY AIR FORCES

STAFF, PSYCHOLOGICAL RESEARCH UNIT NO. 1
*Nashville Army Air Center (AAFCC), Nashville, Tenn.**

The present article is the second in a series describing the Aviation Psychology Program of the Army Air Forces. A general outline of the Aviation Psychology Program is presented in the first article of this series.† The present report deals with the history, organization, and procedures of Psychological Research Unit (PRU) No. 1, Nashville, Tennessee. The emphasis in this report is placed on research and test development although the major portion of the time and energy of the staff at Psychological Research Unit No. 1 is devoted to standard testing, scoring, and preparing recommendations for training.

I. FUNCTIONS, HISTORY, ORGANIZATION, AND PERSONNEL

The functions of PRU No. 1 may be stated as follows: (1) to administer to candidates for aviation training a prescribed battery of classification tests, and to combine and interpret the scores on these tests so that recommendations can be made concerning the type of aircrew training for which each trainee is best qualified; (2) to carry out research for the invention, development, and refinement of new techniques in the fields of motivation, interests, personality, and temperament for testing the characteristics that are required for various types of duty.

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* This article is based on the Annual Report for the Fiscal Year of 1943, prepared by the Staff of Psychological Research Unit No. 1 and covers the period from the beginning of the Unit to June 30 1943. The materials were abstracted and edited in the Psychological Branch, Research Division, Office of the Air Surgeon, Headquarters Army Air Forces.

† *Psychol. Bull.* 1943, **40**, 759–769.

The beginning of the Unit dates from the arrival of Major (now Lt. Colonel) Laurence F. Shaffer at Maxwell Field, Alabama, September 21, 1941, where he assumed his duties as Director. In July, 1942 the Unit moved from Maxwell Field to the Nashville Army Air Center.

The early activities of the Unit were devoted to research in pilot selection and the development of appropriate techniques therefor. As procedures were developed and standardized, a stage was reached where the dual functions of research and testing could be carried out simultaneously.

The internal organization of PRU No. 1 includes three principal sections: Administration, Testing, and Evaluation. On the Administrative Staff are the Director, Executive Officer, Personnel Officer, and Supply Officer. The Test Section includes supervision of both the pencil and paper (group) tests and the psychomotor (individual) tests as well as the development and validation of testing procedures. The Evaluation Section is responsible for the scoring of the group tests, the aggregate weighting sheet operations, the preparation of reports, and the maintenance of records.

The personnel of the Unit as of June 30, 1943 consisted of 24 officers and 109 enlisted men. All of the officers are graduates of accredited colleges or universities with either an undergraduate major in psychology or graduate work in this field. Many of them had instructional and research experience before joining the Army. The enlisted men represent, in general, a younger and less experienced group, but almost all are college graduates. Ninety percent of the officers and approximately 55 percent of the enlisted men hold advanced degrees in Psychology. A list of the names of the officers and enlisted men who have been on duty in the Aviation Psychology Program at PRU No. 1, follows. Several enlisted men have been reassigned to the Unit following their graduation from Officer Candidate School. Their names appear on both of the following rosters.

Officers who have been Assigned to Psychological Research Unit No. 1

Baer, Reuben A.
Ben-Avi, Avrum H.
Boring, Frank H.
DeMott, John J., Jr.
Ellison, Harry O.
Fisher, Raymond H.
Gilmer, Beverly von H.
Hadley, Howard D.
Haire, Mason
Harless, Byron B.
Heathers, Glen L.
Hobbs, Robert N.
Hollinshead, Merrill T.
Lepley, William M.
McQuitty, John V.
Miller, Neal E.
Munson, Charles B.
Roshal, Sol M.
Rothney, John W. M.
Shaffer, Laurance F.
Smith, Moncrieff H., Jr.
Stein, Seymour P.
Super, Donald E.
Thatcher, John S.
Van Saun, Horace R.
Ward, Lewis B.
Wickert, Frederic

Enlisted Men who have been Assigned to Psychological Research Unit No. 1

Aborn, Murray
Allison, Norman
Angoff, William H.
Arnott, Alfred S.
Barker, William S.
Barrows, Gordon
Bates, Jerome E.
Bato, Andrew G.
Beck, Maurice P.
Ben-Avi, Avrum H.
Berwick, Leonard
Bitzer, John A.
Blake, Robert R.
Blum, Gerald S.
Bollinger, George
Brockwell, John
Bross, John R.
Bronfenbrenner, Urie
Brower, Daniel
Castle, William P.
Cheney, Robert B.
Christenson, James A.
Chucnin, Walter
Clark, William K.
Cook, Francis K.
Costin, Frank
Crumbaugh, James C.
Delman, Louis
DePalma, Nicholas
Deutsch, Morton
Deutscher, Max
Dice, Robert F.
Dixon, Robert E.
Droste, John
Druitt, William F.
Duerr, Howard J.
Elkin, Albert
England, Arthur O.
Ewing, Thomas N.
Farrell, Francis M.
Feifel, Herman
Feingold, Sol
Fisher, Burton R.
Fitts, William H.
Flora, Wesley
Freeburne, Cecil
French, John E.
Gagne, Robert M.
Garber, William F.
George, Edgar D.
Gleason, John F.
Gleason, John G.
Glaser, Carl
Goldman, Bernard
Goodrich, Leroy A.
Goodwin, William F.
Graff, Smith S.
Grant, Vernon
Green, Lewis P.
Green, Michael
Grier, Daniel J.
Grochola, Chester W.
Hadley, Howard D.
Hall, Harvey
Hall, Wilbur J.
Hand, Wilson B.
Harding, John S.
Harper, Robert S.
Harris, Dwight
Harris, Frank J.
Hausman, Howard
Hemphill, John K.
Hickman, Norman
Holt, David
Hurley, David J.
Hurvitz, Nathan
Ismael, Walter W.
Kahlert, John
Kaufman, Ben
Killian, Frank, Jr.
King, Joseph E., Jr.
King, Wilbur R.
Kisciras, Ted P.
Klein, George S.
Kogan, William S.
Kornreich, Jerome S.
Kosseff, Jerome W.
Krueger, Frederick W.
LaVine, Harvey B.
Lawrence, Warren R.
Lehman, Albert
Lind, Robert V.
LoMaglio, Samuel
Lynde, Glyndon
MacNaughton, John F.
McDowell, Frank K.
McLanathan, Frank L.
McVitty, Lawrence F.
Marquis, Ben
Marsh, Harold C.
Martin, Ben M.
Matthews, Jack
Merrill, Roger, Jr.
Mitchell, Richard
Moriarty, Francis M.
Nagge, William H.
Nevard, Carlisle
Nogee, Philip
Nygard, John W.
Orbach, Charles E.
Ortof, Murray
Overholt, William A.
Proshansky, Harold M.
Punke, Harold J.
Raush, Harold L.
Raylesberg, Daniel
Raymond, John J.
Reis, Walter J.
Reneau, Willard
Rieman, Glenn
Robinson, Preston K.
Robinson, Richard
Romano, Frank
Rosenberg, George L.
Roshal, Sol M.
Roth, Harold I.
Routhier, Francis X.
Rust, Ralph
Schmitt, Anthony J.
Shrader, John C.
Simkin, James S.
Singer, Martin
Slater-Hammel, Arthur T.
Slawson, Robert
Smith, Alwood
Smith, Herbert A.
Sperling, Philip I.
Spink, Frank H.
Srole, Leo
Stackpole, Stephen
Staiman, Martin G.
Stauffer, Russell
Steinzor, Bernard
Stellar, Eliot
Stevens, William C.
Stolurow, Lawrence
Stone, Gideon B.
Strauss, Harold
Swift, Frederic W.
Tanberg, Merritt C.

Taylor, Everett
Thompson, Vincent P.
Thurlow, Willard
Tice, Frederick G.
Turner, Ralph H.
Valentine, John A.
Vallance, Theodore
Van Saun, Horace
Wainhouse, Edward R.
Wallen, John L.
Weitz, Joseph
Weston, Julien V.
White, Benjamin W.
Wiley, Llewellyn N.
Williamson, Robert
Winebarger, Richard
Wischner, George J.
Wolfe, Evan L.
Wood, Homer G.
Wright, Henry W.
Yellin, Herbert C.
Zielonka, William A.
Zimmerman, Louis R.
Zucker, Herbert

II. PROCEDURES

The following discussion describes the procedures whereby candidates were processed during the period covered by this report. These procedures were similar at all three of the original Psychological Research Units. This description will give a systematic background to the problems of research to be discussed below and in subsequent articles in this series.

Before arriving at the Classification Center the candidate has had a preliminary physical examination and has successfully completed the Aviation Cadet Qualifying Examination. In the morning and afternoon of the first testing day at the Classification Center the group tests are administered. These tests are given in a large room seating 200 trainees, each candidate having a section of table two feet square for his use and separated from his neighbors on either side by partitions one foot high. The room is in charge of a group test officer, typically assisted by five or six group test proctors. During the day, the candidate fills out a number of forms and takes approximately fourteen pencil and paper tests. In addition to the pencil and paper tests currently used for classification, new tests are administered from time to time for purposes of experimental development and validation. This administration occurs after the classification tests have been taken.

On the second testing day, the candidate is examined with the second part of the psychological battery which consists of the psychomotor tests. These tests are arranged so that four candidates may be tested simultaneously. Except under unusual circumstances, all candidates take the individual tests in a standardized order which has been found to yield the smallest transfer effects of each test on the others in the psychomotor battery. Six of these individual tests are taken. In addition to the official classification tests, each trainee may take one or more research tests that are being administered for development or validation purposes. The research tests follow the last test in the classification test line and are given under the same conditions as the classification tests. Twelve copies of each official psychomotor test are employed. Fifteen minutes are required for each of the six tests.

By the time the candiate has finished the psychomotor tests, the answer sheets for the group tests have been scored on the electrical test scoring machine and the scores entered on aggregate weighting sheets. Immediately after taking the psychomotor tests, the candidates' scores are converted to standard scores and entered on the aggregate weighting sheet also. Four weighted averages are computed: one for bombardier, one for navigator, one for pilot and one for officer suitability as described in the previous article in this series. The weight to be assigned each test score is plugged into the aggregate weighting board of the test scoring machine, and the weighted average is determined by running the aggregate weighting sheets through the machine. This is done four times, once for each of the scores; the process is then checked by repeating it. From statistically prepared tables, each weighted score is converted into the corresponding aptitude score for pilot, bombardier, and navigator.

A record card containing aptitude scores, training preferences, and previous experience is submitted to the head of the Evaluation Section for action in accordance with the current directive which prescribes the method by which recommendations for pilot, bombardier, navigator, or non-aircrew training will be made.

The procedures at the seven new Medical and Psychological Examining Units are the same, except that final classification for pilot, bombardier or navigator training is not made until the aviation student has completed his college training period and reached a pre-flight school.

III. Research

In September, 1941, Psychological Research Unit No. 1 was assigned primary responsibility for the development of tests in the fields of emotion, personality and temperament. The process of developing tests may be divided into four stages: (1) *job analysis*, (2) *test construction*, (3) *experimental administration*, and (4) *validation*.

From the very beginning, the members of this Unit have emphasized the need for job analysis by first-hand contact with the actual conditions of training. This has involved analyses of descriptions of jobs, discussions with pilots, discussions with instructors, and direct observations of flying.

As a result of these studies and of discussions with Flight Surgeons and American and Allied officers returned from combat, those qualities were gradually defined which might be said to lie within the limits of the field assigned and which, for one reason or another, might be supposed to be important in determining the individual's success in aircrew training and combat performance. A summary of the broad categories, which are considered to be important areas for research rather than independent or unitary traits, includes the following: resistance to confusion in performing complex tasks, resistance to distraction, freedom from fear of physical danger, resistance to social criticism and fear of failure, emotional stability, consistency of performance, endurance of fatigue and discomfort, motivation and interest, social adjustment, and "apperceptive pattern." The immediate objectives of the research activities of PRU No. 1 are the invention, development, and refinement of techniques for measuring these categories and abilities.

Certain working assumptions were employed in the development of tests in the areas of emotion, personality, and temperament. Some of these are general while others are specific to the field under investigation. A brief listing of these assumptions follows:

1. Measures of aptitude for aircrew training should be based upon an intimate and detailed understanding of the requirements for the various types of training. It is, therefore, necessary to make and use detailed job analyses of the various types of jobs, of difficulties experienced, of the most common reasons for elimination, and of the typical characteristics of individuals who succeed as contrasted with the characteristics of individuals who fail.
2. The final test of the efficacy of any measurement procedure is its empirical validity for the prediction of aircrew success.
3. Tests of emotion, personality, and temperament cannot be separated completely from intellectual, perceptual, and coordination tests. It is assumed that the candidate learns his task as a whole individual.
4. Excessive emotional interference with intellectual, perceptual, or coordination learning and various general or special unsuitabilities of personality, temperament, and motivation are important causes of elimination from aircrew training.
5. At least two factors are involved in predicting the effects of emotion-provoking situations on aircrew performance: (a) The amount of emotion produced by a given stimulus situation, and (b) the degree to which adaptive performance is facilitated or interfered with by this emotion.
6. Susceptibility to emotion-producing stimulation is not a completely generalized habit, but is often specific to the type of stimulus situation eliciting the emotion and to the type of task interfered with by it. Therefore, tests for the selection of aircrew personnel should, in general, be based on work samples resembling crucial aspects of the actual situations involved in training and combat.
7. A frequent cause of emotional response in training is the complexity, difficulty, and rapidity with which the required tasks are presented to the learner. It is, therefore, important to measure the degree to which individuals can continue to perform tasks effectively when these tasks become rapid, complex, and difficult. In this connection, it is also assumed that ability to recover a normal degree of efficiency in ordinary tasks, after having been confused by an excessively complex task is an important factor.
8. It is important for aircrew members to be able to maintain a competent level of performance under sudden, intense, or unexpected stimulation that would ordinarily induce fear.
9. People differ in their susceptibility to disturbance by social threats, and the ability to resist the effects of criticism and of fear of failure is an important factor in success in training.

10. Individuals vary in their ability to maintain performance on a satisfactory level when it is accompanied by distractions, disturbances, and inducements to inattention.

11. The ability to perform a task on a consistent level as contrasted to erratic performance is a significant factor.

12. Successful aircrew trainees must have the ability to maintain efficient performance under conditions of fatigue, discomfort, and pain.

13. Motivation and interest are particularly important in aircrew training.

14. The quality of social adjustment of individuals varies greatly and is relevant to success in training.

15. Potentially successful aircrew trainees may perceive, interpret, or judge situations in ways that are typically different from the responses of potentially unsuccessful trainees. These differences in "apperceptive pattern" are assumed to indicate the presence of emotional habits which will generalize to both the testing and the training situations.

16. Initial performance or adjustment is an important factor in predicting later performance.

A number of psychologists and organizations outside of the Aviation Psychology Program have aided in the development of the research program by making available ideas, techniques, and apparatus in the field of personality and temperament. Several psychologists have served as special consultants.

A number of techniques have been developed or modified and tried out in the fields of emotion, personality, and temperament at PRU No. 1. For example, the development of techniques for presenting subjects with increasingly complex situations up to the point of breakdown of coordinated performance represents an important contribution of the research program at this Unit. Again, the use of social threats to produce deterioration in performance, in the study of individual differences in degree of susceptibility to such threats, represents a relatively novel approach to aptitude testing. Under the category "resistance to distraction" a number of novel techniques have been tried out, some of which have shown considerable promise. In the category of "motivation and interest" some important contributions have also been made. The technique of measuring interest (a) by means of information tests in areas of experience characteristic of such interests and (b) by means of gaps in items of common knowledge produced by fundamental patterns of avoidance and dislike have resulted in two or three instruments of considerable promise. Continuous attempts have been made to avoid questions and items the answers to which can easily be falsified. Also, situations depending for their emotion-producing value upon surprise or deception have not been employed. Within each of the areas which have been listed, the unique contribution of PRU No. 1 has been the specific application of one or more techniques to the vast testing program involved in aircrew selection and classification.

During the past year 63 different test situations were set up and tried out on aviation trainees at this Unit. Analysis of the later success of these trainees will indicate the success with which this aspect of the program has functioned. Certain techniques have already proven relatively successful and have shown some validity. Two of these test situations will be described in a following section of this article as examples of accomplishments.

In addition to research pertaining to test development and validation, other research was performed. This included job analysis studies, research detachments working on special projects, studies of the nature of the trainee population, studies of the effect of apparatus and apparatus operator upon test performance, interrelationships among tests, and a variety of investigations relating to norms, administration, scoring procedures, etc.

IV. TEST DEVELOPMENT

As examples of accomplishments, two tests developed at PRU No. 1 will be described. The first of these is a group test involving pencil and paper materials and is administerable to groups of candidates simultaneously. The second technique is an individual test involving the use of apparatus and requiring administration to individuals either one at a time or in very small groups with multiple equipment.

A. *Sports and Hobbies Participation Test.* The opinion is widely held that young men who participate actively in sports make better fliers than those who do not. To determine whether or not an individual has participated in sports is not quite as easy a matter as it seems at first glance. Merely to ask the individual about his participation, as by having him fill in a blank, may lead to exaggeration, or even falsification. A skilled interviewer may elicit the correct information, but interviewing is so time consuming as to be impracticable in the mass handling of thousands of individuals. Another method of determining whether an individual has participated in certain sports or hobbies might be to ask him questions of information, so chosen that the correct answers would be known to participants in the sport or hobby concerned, but not nearly so readily known to those who have been merely spectators or who have a "book knowledge" of the activity.

Work was started on the Sports and Hobbies Participation Test on the assumption that interests in various avocational activities were likely to be prognostic of aircrew success. It was assumed that these avocations satisfy interests which can also express themselves in one or more aircrew jobs, and that interest can be measured in terms of the amount of information that an individual has acquired by participation in an activity. The first step in the actual construction of the Sports and Hobbies Test consisted in deciding on a list of 30 avocations which would be explored. These included very active sports which might be presumed to be indicative of the interest generally assumed to be characteristic of successful pilots; also included were hobbies such as chess and photography which might possibly be indicative of an interest in more intellectual or symbolic kinds of activities which many people believe to characterize navigators.

The next step in the development of the test consisted of making 20 to 40 questions of the multiple-choice type on each sport or hobby. No question was included unless the right answer was unequivocal, and unless experts believed that the individual would know the facts concerned only by participating in the avocation.

After the test items had been written, the next step was to administer the test to appropriate examinees in order to determine the extent to which score on the test was related to performance in training. By the Spring of 1943, the candidates who had taken the experimental forms of this test in the preceding Fall had completed primary pilot training, and it was possible to determine which questions were answered correctly by a significantly larger proportion of graduates than of eliminees. The project had not contemplated validating the items of these experimental forms as they had served primarily as the basis for developing subsequent forms of the test; but a refinement of another general test of interest was desired and the items on the experimental forms of the Sports and Hobbies Participation Test were therefore validated. The needed pilot items possessing a significant degree of validity were found. For example, twice as many graduates as eliminees knew the right answer to a certain question concerning poker playing. Also, about three times as many graduates as eliminees could answer a certain question concerning pole vaulting. It is expected that the validation data for the final forms of the Sports and Hobbies Participation Test will soon make possible the construction of a full length information test of significant interests in approximately 30 different sports and hobbies.

B. *Control Confusion Test.* A common cause of elimination from aircrew training is a tendency to become confused when performing tasks that are complex, unusually difficult, or very rapidly changing. Examination of the tests already used in classification of aviation trainees and of available techniques and tests led to the conclusion that this fact of complexity in terms of division of attention was probably inadequately represented in the classification test battery.

In approaching the problem of designing a task of complexity of a type similar to that experienced in flying, it was necessary to determine the dimensions of complexity involved. Job analysis of the pilot's task revealed the importance of delicate and skillful manipulation of the controls in accordance with the required patterns of movement. This was found to be particularly important in coordinated movements involving simultaneous use of more than one member. Still another aspect of the complex criterion task is the sequential nature of the activities involved. The successful pilot probably performs many of the so-called simultaneous adjustments actually one after another in sequence. The ability to make such movements systematically in rapid sequence is probably very important in flying. Finally, there was the necessity for division of attention on the perceptual and performance levels.

Work was started on the development of a test which would meet the requirements described above. Considerable difficulty was encountered in constructing an apparatus suitable for such a test situation. The first device constructed combined a task requiring delicate manipulation with the feet and simultaneous performance of additional tasks with the hands according to a sequence of visual cues. The trial of this device on a sample of cases indicated that the task set for the subject was so complex that it took more than a fifteen minute test period to master. Insight gained from observing subjects performing the test indicated that mere simplification of the task would be unlikely to provide the kind of test originally intended. Work was therefore abandoned on this particular model and another attempt was made along somewhat different lines.

The next test device consisted of a clock and a series of switches, one of which would turn off the clock. The subject's task was to discover the correct switch to stop the clock. Division of attention was induced by having the subject simultaneously maintain an adjustment on another lever, the cue for this adjustment being the presence or absence of red or green lights. Which switch would succeed in stopping the clock was arranged in a pre-determined series and changed every ten seconds. Observations of the performance of subjects on this task indicated that chance success in discovering the correct switch played too large a part in determining the score. In addition, the division of attention involved seemed insufficient to attain the objectives desired.

The next apparatus constructed was the Control Confusion Test. This apparatus consisted of seven airplane controls each of which had a number of contact points permitting the correct setting to be changed by the examiners. The task of the candidate was to stop the hand of a clock in front of him by getting all seven controls correctly set at the same time. The correct setting for each control was changed frequently during the test so that the subject had constantly to adjust to a changing stimulus situation. A record was kept of the length of time during the test that the subject had all seven controls set correctly, as well as a separate record of the time each of the controls was set correctly. In order to gather additional results concerning the performance of this task, observational data were obtained. Emphasis was placed on the subject's general manner of approaching the task, on the amount of confidence he displayed in the situation, on the precise manner in which he operated the controls, and on any additional features which appeared significant to the experimenter.

The Control Confusion Test was administered for validation purposes in June, 1943. The test was administered under conditions of observational stress which involved performing the test with the examiner and candidate on different sides of a one-way vision screen. The trainee was informed that he would perform the test under close critical observation. Further, the directions for the test included considerable criticisms of his performance throughout the test. Results indicated that the test was set on somewhat too high a level of difficulty to differentiate trainees successfully. However, very marked individual differences appeared both in clock scores and in the observational data.

In order to try out the Control Confusion Test under conditions of administration more readily adaptable to the classification procedures, the general test situation was modified by removing the one-way vision screen and the verbal criticism of performance. It is considered desirable to add a number of stimulus features to the situation to make the divided attention feature more predominant. It also seems desirable to make the operation of the controls more interdependent. The foregoing proposed changes refer to the nature of the task to be performed by the subject. Other changes being contemplated will improve the administration of the test. It is intended to replace hand manipulation of control switches with an automatic timing device, and to modify the recording aspects of the situation by integrating the present scores on the several controls. As soon as these changes have been made the test will be readministered for further validation.

Including the two tests described above, sixty-three tests were developed or modified and tried out experimentally. In the area of resistance to confusion in performing complex tasks, four tests were tried out including a conflicting manipulation test and two observational measures. Three tests were administered experimentally in each of the following areas: freedom from fear of physical danger, resistance to social criticism and fear of failure, and emotional stability. Five tests of resistance to distraction were tried out, one of which required ability to perform arithmetic computations under conditions of distraction. One test of consistency of performance and one of endurance of fatigue and discomfort were administered experimentally. In the field of motivation and interest, seventeen experimental measures were administered. These included measures of preferences, attitudes, interests, general and technical aviation information, experience, and past history. Seven tests of social adjustment were administered including several measures of self-confidence. In the field of "apperceptive pattern," defined in terms of the perception, interpretation, and judgment of unstructured situations, six tests were tried out including the Rorschach Test and Murray's Thematic Apperception Test.

In addition to these tests in the field of emotion, personality and temperament, thirteen tests in other fields were developed and administered for experimental purposes.

During the current year, PRU No. 1 will continue to emphasize research in the field of personality and temperament. In addition, problems in the field of training will be studied.

SOCIAL PSYCHOLOGISTS IN NATIONAL WAR AGENCIES

DONALD G. MARQUIS
Office of Psychological Personnel

In World War I the major contribution of psychology was in the development and application of group tests of intelligence. In the present war there has been a remarkable expansion in this field, such that the measurement of intelligence and occupational aptitudes has become the accepted basis of selection and classification in the armed services. At the same time, other fields of psychology have found new and valuable application in critical areas of the war effort. Social psychology is one of the most prominent of these, and the measurement and analysis of group attitudes bids fair to follow the pattern of development and exploitation which intelligence testing has undergone.

The scientific study of social psychology has been undertaken to any considerable extent only within the past twenty years. At the time of our entrance into the war, however, there were well developed techniques for the experimental study of attitudes, for market surveys, for propaganda analysis, and for public opinion polling. These techniques, and the research methods lying back of them, have gradually found application in several important phases of the national war effort.

It is much too early to write a definitive study of war-time social psychology. The pattern of activity and the personnel are continually changing. Most of the research cannot be described for security reasons. This article will, therefore, attempt to present for psychologists a superficial overview of the agencies and persons who are involved. The real reports will be made by the social psychologists themselves at some later time when they have freedom from security restrictions and from the tremendous pressure of their war time work. No attempt is made here to survey the extensive civilian work in social psychology which is systematically reviewed and documented by Allport and Veltfort (1).

I. Division of Program Surveys

Department of Agriculture

The first government agency to establish a program of systematic attitude research was the Department of Agriculture. When the Bureau of Agricultural Economics was named the central planning and research agency for the Department in 1939, the Division of Program Surveys was set up with Rensis Likert as head. Since that time the Division has grown in size and has increased the scope and effectiveness of its procedures. In recent years its services have been made available to several government agencies outside the Department of Agriculture.

The Division carries out its studies with a staff of field interviewers and a central organization for planning, analysis and formulation of reports. The nature of the problems and methods is indicated by the following selected paragraphs from an article by Hans Skott (4):

> Sometimes the Division has simply provided data on general reactions to the administration of major agricultural programs, or the reactions in particular parts of the country. Sometimes it has helped action agencies plan the detailed operation of programs: occasionally, in this connection, it has worked with agencies to test new programs experimentally on a small scale before they were put into general operation in order to shake the costly "bugs" out of them. Sometimes it has tested popular knowledge levels with respect to a given fact such as the wartime need for dairy production. Often it has performed combinations of these functions.
>
> As the Division has become better established as an operating agency, it has attempted increasingly to translate its findings into suggestions for administrators. On the basis of findings, recommendations have been made for (1) major changes in the administration of operating programs, in terms of expressed complaints or suggestions or to meet changed conditions, and (2) minor or local revisions of programs to fit the needs of particular localities.
>
> Methodologically, the work of the Division of Program Surveys represents in general a new approach in attitude investigation. The research apparatus of public opinion polling consists of certain standard tools: part-time interviewers, purposive or quota sampling, fixed alternative questions, and mechanically codable answers. Because the functions served by the Division of Program Surveys, however, are quite different from those of commercial opinion polling, the methods of gathering and analyzing the data which have been developed are accordingly quite different.
>
> The major methodological problems, in brief, have been (1) to develop sampling methods which would give a truly representative miniature of that part of the population affected by specific problems being investigated; (2) to tap *complete* and trustworthy expressions of attitudes toward and experience with specific topics or programs, and to secure such reactions in a uniform, reliable way from all people interviewed in so far as possible; and (3) to devise methods of analysis which, while permitting quantitative treatment of the data, would yet preserve the context of the rich narrative material.

These objectives are accomplished by means of improved methods of stratified sampling, "open-ended" interviews, the use of professional personnel as full-time interviewers, and the quantitative analysis and treatment of the data.

The Division carried on work for the Office of Facts and Figures and the Office of War Information on a reimbursable basis from December, 1941 to November, 1942. The staff during this period included the following psychologists:

Frieda Bayroff (Mrs. R. C. Tryon)
Jerome S. Bruner, Princeton University
Angus Campbell, Northwestern University
Charles F. Cannell, Ohio State University
Dorwin Cartwright, Iowa Child Welfare Research Station
Dwight Chapman, Bennington College
Kenneth E. Clark, University of Minnesota
Bernard J. Covner, Ohio State University
Richard S. Crutchfield, Swarthmore College
Douglas G. Ellson, University of Mississippi
Burton R. Fisher, Yale University
Rosalind Gould, Bank Street School, New York
Ernest R. Hilgard, Stanford University
Herbert H. Hyman, Columbia University
Sara Jane Holtzberg, Columbia University
Daniel Katz, Brooklyn College
I. Krechevsky, New American Publications, Chicago
Wilma Lloyd, Institute of Child Welfare, University of California, Berkeley
Nathene Loveland
Robert B. MacLeod, Swarthmore College
Eleanor Maccoby
Sydney Roslow, New York State Education Department
M. Josephine Schlatter, Institute of Child Welfare, Berkeley
Jerome M. Seidman, Brooklyn College
Jane A. Shepherd, Federal Security Agency, Washington
Ruth Tolman, Los Angeles, California
Mildred Werner

At the time of this writing the following are engaged in work of the Division: Bayroff (Mrs. Tryon), Campbell, Cannell, Cartwright, Crutchfield, Gould, Maccoby, Schlatter and Likert, Director.

Consultants who have served with the Division include Gordon Allport, Harvard University, Harold C. Coffman, Northwestern University, Kurt Lewin, University of Iowa, Gardner Murphy, College of the City of New York, Carl Rogers, Ohio State University, and Ralph White, Cornell University.

II. OFFICE OF WAR INFORMATION

The best overall picture of the general activities and functions of the OWI is provided by a symposium of thirteen articles published in the Spring 1943 issue of the Public Opinion Quarterly.

In the domestic branch of OWI, concerned with information problems on the home front, psychologists have served chiefly in the Bureau of Intelligence, R. Keith Kane, Chief, which came into existence with the Office of Facts and Figures in December, 1941, and lasted until a reorganization in March, 1943, when many of its functions were absorbed in a new Bureau of Special Services.

The Division of Intensive Surveys was headed from December, 1941 to November, 1942 by Rensis Likert, whose staff of the Division of Program Surveys of the Bureau of Agricultural Economics was under contract to OWI. This Division employed more psychologists than any other within OWI.

The Division of Extensive Surveys, later the Surveys Division, Elmo C. Wilson, Chief, continued through the OFF period, and survived the dissolution of the Bureau of Intelligence. Psychologists serving with it have included Hazel P. Gaudet, Ernest R. Hilgard, Robert P. Hinshaw, Herbert H. Hyman, and Daniel Katz.

These two divisions have been responsible for surveys of the public on matters of war information as affecting public participation in various war-centered campaigns. A variety of methods have been used, from national samples to special community investigations.

Consultants to the Bureau of Intelligence included Hadley Cantril, Princeton University, George H. Gallup, American Institute of Public Opinion, Paul F. Lazarsfeld, Columbia University, and Frank Stanton, Columbia Broadcasting System. Raymond H. Franzen for a time headed a special planning and clearance unit known as Audit and Review within the Bureau of Intelligence.

Also in the same Bureau was a Special Services Division, headed by Lucien Warner, New York City, whose staff included Eugene Hartley, City College, New York, and Ruth Tolman. Their province included the study of special topics where problems were critical, and special regional and area studies. One of the techniques used was that of a correspondence panel, which has been continued by the Bureau of Special Services.

Edward N. Barnhart, Reed College, and Sidney H. Newman, Michigan State College, served in the Media Division, which undertook analysis of the press, radio, and motion pictures as channels of communication to the public.

The Overseas Branch of OWI is concerned with information programs to friendly countries abroad and with propaganda programs to our enemies. The Central Intelligence Panel was roughly the Overseas equivalent of the Bureau of Intelligence and the principal source of research and analysis on foreign regions. Edwin R. Guthrie, University of Washington, and Allen L. Edwards came over from the War Department for a time. Otto L. Klineberg, Columbia University, was one of the first psychologists appointed; he served in relation to German language programs. Heinz L. Ansbacher, Brown University, has been selected to be sent to one of the outposts abroad.

Early in 1943 there was established in Washington a Bureau of Research and Analysis, Eugene Katz, Chief, later becoming the Bureau of Overseas Intelligence. The purpose of this Bureau is to assure a systematic and orderly processing of intelligence information, to exploit thoroughly a variety of intelligence sources, and to collect, analyze, and collate intelligence information for operational and policy purposes. The Bureau provides intelligence to aid operations by supplying background material, and it aids the planning deputies and regional chiefs in the formulation of policy decisions. Several psychologists have been associated with this Bureau. Among them are Leonard W. Doob, Yale University, Ernest R. Hilgard, Theodore M. Newcomb, University of Michigan, Sidney H. Newman, Helen Peak, Randolph-Macon College. Ali Shamsee, and Lucien Warner, who is now serving as instructor with the OWI Technical Center. Leonard Doob has recently been appointed Assistant Chief of the Bureau.

Some of the names appear in several of the divisions because of shifts following reorganizations. The scale of the work has changed from time to time as the war has progressed. This is to be expected in work as new as that faced by the Office of War Information.

III. RESEARCH BRANCH, MORALE SERVICES DIVISION

The Morale Services Division of the War Department was formerly called the Special Service Division. A recent issue of the Army-Navy Journal carries a brief account of the work of the Research Branch:

> Finding common denominators among army men's recreational, educational and informational needs and preferences is a problem of the Special Service Division's Research Branch. With techniques developed from peacetime social science research, this branch is measuring what the soldier wants, how he reacts to his Army experiences, what gripes him most and why, and what he would like to see done about it.
>
> These studies are made because research has demonstrated that soldier attitudes underlying morale can be improved markedly by meeting his reasonable desires and needs in a systematic fashion. The studies have proved so successful that, although they deal mainly with Special Service matters, many other branches of the Army are now finding them useful guides in handling other soldier problems (2).

The work done by this research staff falls into two categories: (1) surveys and (2) experimental studies as described by Stouffer (5).

> Methods have been worked out, after a good deal of trial and error, of questioning enlisted men in an atmosphere of anonymity which produces frank and earnest answers. The research staff has made studies in about eighty-five camps in the Army ground forces and air forces in continental United States and at several overseas bases.
>
> The research work is not confined to surveys. In addition, there is being carried on a systematic program of actual experimental studies. The idea of controlled experiments is not new in the Army. It is used routinely in testing new weapons and other articles of equipment. But it is perhaps a new, and

somewhat exciting, development to see the experimental methods of natural science applied by the Army in the field of social psychology.

A motion-picture film especially prepared, let us say, to create better understanding of one of our allies is believed to have six determinable objectives. The research staff designs a technique for measuring the degree to which each objective has been attained. Two matched groups of men are pretested; one group sees the film, and a control group does not. Both groups are restudied after a week or two, thus making it possible to measure how much influence the film has had with respect to each of the predetermined objectives. Many modifications can be and have been introduced in designing the experiments. For example, a third group can see the film, followed by an informal discussion. The time interval can be varied. With the help of these results, advice can be given about needed changes in film material or about emphases which need to be made in the new films yet to be produced.

This is one of the special fields in which experimental studies have been made or are in preparation. In quite another area considerable experimental work has been done on physical conditioning, with a view to measuring effects produced by attempts to improve the physical training. Extensive preparatory work is also under way on the subject of fear, again drawing on the best social psychological knowledge available and attempting to provide a better scientific basis for teaching methods of controlling fear.

In the process of carrying out this work, the research staff has made some progress in the development of improved instruments of measurement which may be of considerable importance to research in social psychology and sociology in the future. A new theory of scale construction, for example, developed out of practical needs, has given promise of wide utility (**5**).

Carl I. Hovland, Yale University, is head of the experimental studies and on the staff are the following psychologists:

Frances J. Anderson, University of Iowa
Captain John Finan, Oberlin College
Arthur Lumsdaine, Princeton University
Cpl. Nathan Maccoby, University of Washington
Frederick D. Sheffield, Yale University
Lieut. M. Brewster Smith, Harvard University

The following psychologists have served as consultants to the Research Branch: Hadley Cantril, Rensis Likert, Quinn McNemar.

IV. OFFICE OF STRATEGIC SERVICES

According to the United States Government Manual, "By Military Order of June 13, 1942, the office of Coordinator of Information, exclusive of the foreign information activities transferred to the Office of War Information by Executive Order 9182 of June 13, 1942, was designated Office of Strategic Services (with the former Coordinator of Information as Director), and transferred to the jurisdiction of the Joint United States Chiefs of Staff. As modified by Executive Order 9312, dated March 9, 1943, the functions of the Office of Strategic Services are to (a) collect and analyze such strategic information as may be required by the Joint United States Chiefs of Staff, and (b) plan and operate such special services as may be directed by the Joint United States Chiefs of Staff."

The director of the Office is Brig. Gen. William J. Donovan.

Robert C. Tryon, University of California, is chief of the Psychological Division. Engaged in the various activities of the Office are the following psychologists:

Donald K. Adams, Duke University
Edward W. Arluck, New York City
Edward N. Barnhart, Reed College
Urie Bronfenbrenner, University of Michigan
John W. Gardner, Mt. Holyoke College
J. A. Gengerelli, University of California, Los Angeles
James A. Hamilton, University of California
Robert H. Knapp, Harvard University
I. Krechevsky, New American Publications, Chicago
Robert B. MacLeod, Swarthmore College
J. B. Maller, United States Housing Authority
Donald V. McGranahan, Harvard University
Carleton F. Scofield, University of Buffalo

V. Foreign Broadcast Intelligence Service

In February, 1941, acting upon the suggestion of Lloyd Free and Harold N. Graves, Jr., the State Department arranged with the Federal Communications Commission to undertake to record, translate, analyze and report on foreign broadcasts. Several psychologists were employed almost at the very outset, to carry on analysis of incoming foreign propaganda. These were Audrey G. Menefee, University of California, Donald V. McGranahan and Jerome Bruner, Harvard University, and Sebastian deGrazia, University of Chicago.

In November, 1941, Goodwin Watson of Teachers College, Columbia University, entered upon his duties as Chief of the Analysis Division.

In February, 1942, Theodore M. Newcomb, University of Michigan, and Otto Klineberg, Columbia University, joined the group. A few months later John Gardner left Mt. Holyoke to undertake analysis of Latin American broadcasts. Bronson Price was transferred from his duties in the War Department to head up analysis of broadcasts from and concerning the Soviet Union. One of Klineberg's students, Robert Chin, undertook analysis of radio materials about Occupied China and became an expert to whom other officials turned for information he alone was able to give. In the fall of 1942, Alice G. Thorner, Columbia University, came to work on India and later on other British Empire problems. The most recent addition, as this is written, has been Seth Arsenian whose background qualifies him for work on the Near East.

In November, 1943, Watson discontinued his service as Chief of the

Division and his work was taken over by Theodore M. Newcomb in cooperation with the Bureau of Overseas Intelligence of OWI.

In a personal communication, Watson writes as follows:

> A persistent problem in the Analysis Division has been to find personnel with all of the requisite qualifications. Training in social psychology and propaganda analysis was the primary emphasis at first, and remains useful, but it has been overshadowed by the growing need for intimate and detailed knowledge of the foreign area. Analysts contribute most if they can identify the places, factories, celebrations, newspapers, magazines, business men and political figures mentioned in radio programs.
>
> Quantitative techniques for content analysis were employed almost exclusively at first, but officials served by the reports wanted more concrete discussion of the military, political, economic, and morale situation abroad. The description of quantitative procedure remained, however, as a check against loose, intuitional generalizations.
>
> It is not possible to reveal details of procedure or contribution at this time, but it may fairly be said that this group of analysts has pioneered in a new and fruitful task. Never in wartime, and perhaps never again in time of peace, will our government be without the up-to-the-second information available from study of the millions of words in the tongue of every nation, carried continuously over the world's ether-waves.
>
> It may be premature to try to estimate the gains which psychologists in Washington will bring back to their profession after the war. Those who have worked in the Foreign Broadcast Intelligence Service will testify to at least four important changes: (1) a realization that much of the psychology they studied and taught proved barren in practical work; (2) a greater concern with foreign affairs; (3) an appreciation of contribution of other social scientists which tends to break down departmental distinctions; and (4) skill in writing clear and concise reports for officials who have neither time nor inclination to plough through the usual academic verbiage.

VI. Civilian Opinion Research

Several government departments whose war-time activities have created a demand for measurement and analysis of public opinion have utilized existing organizations rather than set up the necessary staff for the purpose. Mention has already been made of the use of the services of the Division of Program Surveys by the OWI and by other national agencies. Other polling services which have made their facilities available to the federal government are:

American Institute of Public Opinion, Princeton, New Jersey, George H. Gallup, Director.

National Opinion Research Center, University of Denver, Harry Field, Director.

Office of Public Opinion Research, Princeton University, Hadley Cantril, Director, and Jerome S. Bruner, Associate Director.

VII. WAR PRODUCTION BOARD

The Civilian Relations Division of the Office of Civilian Requirements is concerned with consumers' reactions to the necessary shortages in many types of goods during the war period. Ernest R. Hilgard is head of the Surveys Section and Dwight Chapman has recently been appointed head of the Planning Unit. They are conducting surveys of shortages of goods at the consumer and retailer level, attempting to estimate which of the shortages (actual or prospective) are likely to impede the war effort by impairing health or morale.

In November, 1943, for example, a sample of 5000 families were interviewed to determine the items and the effects of consumer shortages. The families were questioned about their experiences in obtaining essential goods and services of 115 types used in homes and on farms.

An advisory committee includes the following psychologists: Raymond H. Franzen, George H. Gallup, Paul Lazarsfeld, S. S. Wilks.

In another division of WPB—the Office of Program Vice Chairman—Harry R. DeSilva is engaged in the preparation of production scheduling orders and regulations. He acts as liaison between WPB and the War Department on scheduling matters and checks the operations of scheduling in industry divisions of WPB and in the regional offices.

VIII. OFFICE OF PRICE ADMINISTRATION

The administration and enforcement of price control and rationing requires an extensive program of statistical reports and surveys to secure the necessary data for planning and for control. The development of standards and procedures for questionnaire construction and review has been described in a recent article by Sells (3).

Responsibility for report and survey forms was assigned in 1941 to the Questionnaire Section, which was attached first to the Research Division and later to the Accounting Division. The first two heads of this Office were economists. Coincident with the establishment of the Rationing Department in the Spring of 1942, when the scope of OPA questionnaire activity began to include forms to be filled out by consumers, the questionnaire section was reorganized and transferred to the Professional Services Department. Charles B. Lawrence, Jr., a sociologist who had studied psychology at Columbia, joined OPA in February, 1942, as Chief of the Office which was then named the Questionnaire Branch. The next reorganization occurred in January, 1943, when the Branch was transferred to the Administrative Management Department, with the present title of Statistical Standards Office. Lawrence became Director of the Statistical Standards Office and held this position until June, 1943, when he transferred to the President's

Committee on Congested Production Areas, and was succeeded by Saul B. Sells, formerly at Brooklyn College. One other psychologist, Raphael B. Blau, Teachers College, Columbia, is associated with the Office at the present time. He is responsible for technical consultation and for review of material for Food Rationing, General Ration Books, Tire Rationing, and for public opinion surveys. Irving Lorge, Teachers College, Columbia University, was a consultant for a brief period.

In reply to a personal request, Dr. Sells has supplemented his published account with the following comments:

> This succession of changes reflects a change in orientation of the functions performed by the Office as well as increased recognition by the Administration of the importance of these functions. As the Office is presently constituted, psychological factors of readability, simplicity and understanding of material, uniformity and consistency in form and design, motivation and rapport of respondents are given equal weight with statistical and economic criteria in the review of forms, instructions, and data collection plans. Formal procedures for pretesting of forms are being expanded.
>
> The Statistical Standards Office has published a mimeographed statement of criteria for review of public reporting forms, questionnaires, and surveys. This is at present the only formal compilation of administrative, psychological, statistical and economic criteria for the guidance of research workers in this field. A form design manual, shortly to be issued by the Administrative Management Department, has been prepared in collaboration with the Business Services Division. This manual deals with format, layout, and printing standards.

Other psychologists in the Office of Price Administration include Eli S. Marks, Industrial Analyst, Executive Office for Price; Thomas L. Bransford, Head, Planning and Analysis Branch, Personnel Division; and James E. Mendenhall, Educational Services Branch. Alvin C. Eurich, Stanford University, was for a time head of the Consumer Division.

IX. FOREST SERVICE, DEPARTMENT OF AGRICULTURE

Social psychological factors in the control of forest fires are the concern of John P. Shea, Senior Psychologist, U. S. Forest Service. In response to request, Dr. Shea has prepared the following statement of his work.

> The scope and importance of the problems in war and peace may be judged by the following: In 1942, forest fires in the United States burned over 31,854,124 acres of wooded land, compared with 26,404,385 acres in 1941. The total number of forest fires in the first war year was 208,218, an increase of 8,516 over 1941. In 1942, fires destroyed enough timber to build 20,000 liberty ships or 2,000,000 Army truck bodies. The diversion of men to fire-fighting constituted a serious drain on manpower that could otherwise be utilized in war production. In addition, a series of ills to natural resources is set in motion by fires, such as flood damage and soil erosion.

Approximately 8% of forest fires in the United States are caused by lightning; 92% by man. With man as the major cause of this destruction and the satisfying of human needs as the goal of conservation efforts in our economy of diminishing resources, it is becoming increasingly clear that human behavior is the central problem in conservation.

Human behavior problems in the conservation of the natural resources of the Nation present a challenge for public service to psychologists, sociologists and social anthropologists, as well as an opportunity to develop and vitalize their sciences.

To come to grips with these problems, cooperative studies by federal and private institutions are being planned to explore the possibilities of fruitful research in human behavior patterns by anthropologists, psychologists and sociologists. Remedial measures are planned by means of law and education. Educational work in schools and colleges and to adult groups is now being done, but on an inadequate scale.

To promote research and to discover better methods of educating the American public in ways of conservation, the Advisory Council on Human Relations has been organized under the sponsorship of the American Association for the Advancement of Science, with representatives of the following scientific societies as members: AAAS—Section I, American Psychological Association, American Association for Applied Psychology, American Anthropological Association, American Sociological Society, Rural Sociological Society, Society of American Foresters, and the National Research Council.

The chairman of the Advisory Council on Human Relations is Horace B. English, Ohio State University, representing the APA. Douglas Fryer, New York University, represents the AAAP, and C. E. Lively, who represents the Rural Sociological Society, is Secretary. J. P. Shea is Liaison Officer between the Forest Service and the Council.

Regional Advisory Councils are being established in strategic areas of the United States to advise conservation agencies on problems of human behavior and to undertake research. Their activities are designed to continue and enlarge after the war. The first such Councils to be organized are on the Pacific Coast. Directing the activities for California, Oregon and Washington are Franklin Fearing, University of California at Los Angeles, E. K. Strong, Jr., Stanford University, and Howard R. Taylor, University of Oregon.

X. BUREAU OF THE CENSUS

By far the largest agency concerned with survey work is the Census, but the development of psychological research is only barely beginning. Several years ago Lynn Baker, University of Wisconsin, undertook a research project. When he left to join the Federal Public Housing Authority, Charles A. Metzner, also from Wisconsin, was appointed Assistant Psychologist in the Division of Statistical Research, and carried on a study of errors of report. Metzner left in 1943 to enter service.

XI. OFFICE OF THE COORDINATOR OF INTER-AMERICAN AFFAIRS

For a year beginning September, 1940, Hadley Cantril and Leonard W. Doob were employed by Mr. Rockefeller's Office as Consultants to conduct public opinion polls or their equivalent in various Latin American countries. A preliminary propaganda analysis unit was also established before the Foreign Broadcast Intelligence Service came into existence.

From September, 1941 until the end of August, 1942, Leonard Doob was the head of a unit in the Coordinator's Office which collected information concerning public opinion and the media of communication throughout Latin America, analyzed certain aspects of Axis propaganda to and in those countries, and made systematic appraisals of the United States' program in South and Central America.

XII. MILITARY INTELLIGENCE, WAR DEPARTMENT

Edwin R. Guthrie, of the University of Washington, joined the staff of Military Intelligence in August, 1941. Allen L. Edwards was brought from Northwestern University a few months later, and they continued to serve until September, 1942 when Leonard W. Doob was transferred from the Office of the Coordinator of Inter-American Affairs to replace Guthrie as Chief Consulting Psychologist. James A. Hamilton, University of California, worked with him for a short time. Doob remained until the Spring of 1943 when he shifted to the Office of War Information.

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DOHERTY, WM. B. & RUNES, D. D. Rehabilitation of the war injured. New York: Philosophical Library, 1943. Pp. viii+684.

This is an assemblage of 53 scientific articles which, with but three or four exceptions, have appeared in American or English journals devoted to physical and occupational therapy, hygiene, and medicine. Eight of the articles pertain to neurology and psychiatry; sixteen to plastic and reconstructive surgery; five to orthopedics; one to vascular and neurological lesions in survivors of shipwrecks; two to legal aspects of rehabilitation; seven to physical therapy; and fourteen to occupational therapy and vocational guidance. A few articles listed in the advance notices do not appear in the published volume. They vary in length from 2 to 42 pages, a majority falling between 10 and 20 pages.

As would be expected, the articles on medical topics, e.g., plastic surgery, head injuries, orthopedics, skin grafting, amputations, etc., are quite technical, whereas those devoted to more general topics, such as rehabilitation policies, ward management of the injured, convalescent centers, and therapeutic aims and methods of occupational therapy are appropriately phrased for lay readers, hospital technicians, teachers, and occupational aides as well as physicians. At least one third of the book could be read with profit by junior and senior college students in connection with introductory courses in psychopathology, mental hygiene, and social service. Although overlapping in discussions of certain topics is noticeable, it is not likely to prove annoying to many readers. However, a not considerable amount of reader-time could have been saved by judicious deletion of introductory remarks and "mere" mention of topics systematically covered elsewhere. This option fell to the editors only, because the authors with but few exceptions had written their papers without thought of subsequent incorporation in a symposium of this kind.

Authors writing on head injuries frequently commented on the proneness of patients to develop psychoneurotic symptoms which colour the syndromes peculiar to head traumata. One writer also differentiates between mental symptoms normally associated with head injuries and those constituting a general mental reaction to bodily injury which patients are likely to have irrespective of the locus of injury. Ofttimes these general symptoms becloud the progress of recovery from cerebral concussions, contusions, and lacerations. There is but one paper that deals exclusively with the patient's reactions to injury. Additional articles on this subject would be welcomed, I am sure, by those who are professionally engaged in work on mental hygiene and rehabilitation.

The several articles devoted to occupational and physical therapy extol the potential benefits of occupational projects affording considerable latitude for self-activity, initiative, and self-expression. The authors advise replacement of passive methods of physical therapy, so far and as soon as possible, with active methods such as those inherent in bedside diversions and curative workshop and prevocational courses. One paper delineates in didactic fashion the specific types of occupational activities through which desired objectives in patient recovery are most likely to be realized. This is a useful guide to teachers who are concerned with curriculum building for the rapid training of occupational aides in the present emergency.

Although vocational guidance is discussed in several articles, subject matter in this area does little more than direct attention to the importance of the topic. Inadequate or conspicuously absent are the discussions of interview methods, aptitude testing, interest analysis, job analysis, and occupations wherein physical handicaps are not vocational handicaps for those with proper training and placement. In fairness to the editors we should say that paucity of good articles on guidance in this section only mirrors the scarcity of sound articles on guidance appearing in current literature on the physically handicapped.

The volume is without an index. The omission of an index will greatly impair its usefulness, for tucked away in articles that appear to be purely medical in content are brief but excellent discussions of psychological problems. Finding them without an index will be a time-wasting task for teachers, occupational aides, psychologists, and others unfamiliar with medical literature. It is regrettable too that many of the half-tones vary from mediocre to exceedingly bad. Those on occupational therapy are so poor that no purpose is served by their inclusion. This is inexcusable today because of the ease with which new photographs can be taken of settings in occupational therapy duplicating those for which existing half-tones are unsuitable.

Despite the foregoing faults the volume has great potential value. It should be placed immediately on reference shelves of colleges of arts and sciences enrolling advanced students in the social sciences, and those of professional schools of education, medicine, health and hygiene, nursing, physical therapy, occupational therapy, and social service. Moreover, the publishers may be advised to bring out a companion volume devoted primarily to articles on the personal reactions of patients to injuries, modern techniques of vocational counselling, pedagogy of the education and reeducation of the physically handicapped, and placement and supervision of handicapped people who have completed their training.

CALVIN P. STONE.

Stanford University.

PENNINGTON, L. A., HOUGH, R. B., & CASE, H. W. The psychology of military leadership. New York: Prentice-Hall, 1942. Pp. ix+288.

This book is to be judged in terms of the need out of which it grew. Throughout 1942 large numbers of young college men were being, or expected soon to to be, drawn into the armed forces as officers and officer candidates. On various campuses there arose a demand for a course in military psychology designed to show inexperienced officers "how to work effectively with all superiors and subordinates." The reviewer was one of those who used this as a textbook and his comments grow out of his experience and his students' comments.

The authors define their plan as follows:

> First, those military problems frequently encountered by most officers are carefully studied. Second, the psychological principles and techniques possessing a direct bearing upon each of these problems are correlated with them. . . . Only those rules that definitely enhance human efficiency in training and in combat have been held acceptable for consideration. The authors, for example, have excluded material pertaining to the causes of armed conflict, to the rival social philosophies underlying the present war, and to the problem of camouflage and its obvious relationship to human observation, since it is believed that these and all other exclusions can be and have been more advantageously treated elsewhere.

The organization and selection of topics in line with these purposes seems to the reviewer excellent. There are chapters covering the Officer as Instructor and as a Learner, as a Leader, a Disciplinarian, a Personnel Technician. Other chapters deal with the officer's own Adjustment to Military Service and his responsibility for Morale. The selection of concepts for these chapters also seems in the main judicious.

Unfortunately the writing shows signs of haste. The vocabulary is commendably untechnical and direct, and the meaning of each sentence taken by itself usually stands forth clearly. But sentence follows sentence like beads on a string rather than in any more complex pattern. Consider the following too typical example.

> The good explanation is therefore characterized by clear, simple, and emphatic presentation of facts and by the use of demonstrational materials. Regardless of the length of the explanation, it must satisfy these requirements. The good instructor is clear and straightforward in his explanations. His explanations are good because he has planned and rehearsed them.

Such writing is clear but it is dull. Moreover, as a result of such weak paragraph organization, one gets little sense of forward movement, and ideas of large scope are slow to arise—this despite the fact that the authors make excellent use of mechanical sign posts such as paragraph headings, outlines, topic sentences and concluding summaries.

Related to the oversimplification of style is one of concepts. There is an enormous elaboration of the obvious and the piling up of bromides. Now for the present reviewer this is not a congenial criticism. I happen to believe that much good teaching consists in catalyzing the learner's previously half-formed ideas. Often a reminder of the obvious is by no means wasted. But it need not be elaborated as in the following passage.

> Inasmuch as the trainee must be instructed under conditions likely to be met in combat and inasmuch as space is never available for the isolation of numerous training groups, the instructor must learn how to lessen the effects of ever-present distractions. Distractions cannot be eliminated in military training. They must be accepted as a part of the training. The officer needs to know effective methods for controlling their effects. He needs to know these procedures for his own good as well as for the good of his men. Suggestions for decreasing the negative effects of distraction follow:

Finally, the amount of psychology in the book is rather small. In its place we find a good deal of advice, and just plain information about the Army—decidedly useful but not, I think, psychology. Thus we are told that officers must support the authority of non-commissioned officers. That is correct, and doubtless rests on sound psychological bases. Those bases, however, are not explicitly recognized. The psychology remains embedded in a welter of specific injunctions; it is not abstracted from its embodiment in concrete form and thus made available for use in other contexts. To take an analogy the book is more like a treatise on teaching methods than one in educational psychology. The distinction is not an easy one to make; for many purposes it may not be necessary, and although this may be one of them, I am doubtful. But it is a very necessary distinction if we are to advance in our understanding and knowledge of human behavior. This book, of course, makes no pretense to extend the science; it does aim to expand the student's understanding of behavior. My students and I felt that it too often failed to carry us much beyond the level of common sense. Yet by heavy majority we also voted that the book was worth reading for every prospective leader of troops.

HORACE B. ENGLISH.

Ohio State University.

Gellhorn, Ernst. Autonomic regulations—their significance for physiology, psychology and neuropsychiatry. New York: Interscience Publishers, 1943. Pp. xii+373.

This book presents the foundations of organismic physiology as it treats not only the physiology of bodily organs but also the interrelationship of those organs. As stated in the introduction, the purposeful reactions of the organism under conditions of stress and strain must have developed during phylogenetic evolution. "*The discovery of those principles becomes the supreme task of an organismically oriented physiology, their application the problem of scientifically oriented medicine and psychology.*"

To appreciate the importance to psychology of Gellhorn's contribution one should recall that it was not long ago that physiological formulation of the emergency functions of the sympathetico-adrenal system seemed to offer psychology a physiological foundation for understanding emotion. But when psycho-physiological research revealed that this mechanism was inadequate to account by itself for complex results, disillusionment and unfavorable reaction followed. Still in need of explanatory principles psychologists and psychiatrists turned as never before to "dynamic" psychological mechanisms and many found them quite satisfying. Neuro-physiological explanations had, in general, not been found useful—they were inadequate. The reason they were inadequate was in part the incompleteness of the organismic physiological knowledge upon which they were necessarily based.

Gellhorn's summary of today's advances in organismic physiology brings to attention crucial elements in the interrelationship of physiological mechanisms without which it is obvious that there could be no understanding of emotion or of the broader physiological foundations of mental life. It becomes apparent, for example, that insight into the role of the hypothalamus in integrating the autonomic concomitants of emotion must be incomplete without companion knowledge of the autonomic regulatory functions of the carotid-sinus. By the same kind of evidence it appears that adrenaline may no longer be thought of merely as an excitant, but must likewise be considered an inhibitor. We are provided not only a mechanism mediating the peripheral autonomic effects of emotional mental processes, but a mechanism by which autonomic conditions, particularly those affecting blood pressure, may exert their influence on (somatic) behavior. It further becomes clear how inadequate is the picture of the part played by sympathico-adrenal function in emotion without including in that picture a view of complementary activity by the vago-insulin system (to the importance of which Gellhorn and collaborators first called attention). It is further seen that not only the familiar increase of sympathetic activity but the inhibition of parasympathetic activity contributes to the effects of noxious stimuli. Transmission of effects is no longer necessarily explained by nerves and synapses, but may be accounted for by the more ubiquitous action of sympathin and acetylcholine. And the prime function of autonomic regulations, the maintenance of cerebral function, can obviously not be understood relative to the continuing fuel and oxygen supply of the brain without present-day knowledge of the all-important role of carbon dioxide. Evidence on these and many related problems is presented in this book.

Gellhorn has discarded the straightjacket imposed by the view that the autonomic system is purely an efferent system. Recognition of functionally useful groupings of autonomic activities into those of visceral-afferent, viscero-visceral, viscero-somatic, viscero-sensory, and somato-visceral mechanism adds much to the usefulness and clarity of his analysis of the autonomic system.

Wealth of evidence from the literature (1100 titles) including extensive results from his own researches provides factual foundation for the work.

Gellhorn has made a beginning toward functional application of the new knowledge of autonomic regulations in a final section on "clinical results and applications." This includes chapters on applications in physiology and pathology, in anesthesia, and in neuropsychiatry. Included are indications of the importance of autonomic regulations in electroencephalographic study of the brain.

To the mind of the reviewer it is on foundations such as these that a new clinically and psychologically useful psycho-physiology will take form. Clinical psychology and psychiatry will yet one day speak with as much assurance and profit regarding dynamic neuro-physiological mechanisms in functional mental conditions, as they now speak with assurance regarding possible socio-psychological mechanisms in those conditions. Gellhorn's *Autonomic Regulations* provides a bridge-head for that advance.

CHESTER W. DARROW.

Institute for Juvenile Research, Chicago.

NEWCOMB, T. M. Personality and social change. New York: Dryden Press, 1943. Pp. 225.

It is not often that psychologists embark on as significant and elaborate an investigation as the one reported in this book. It describes a four year study (1935–39) of the changes in the political and economic attitudes from Freshman to Senior year at a new, progressive, woman's college (Bennington). The aim of the study was to discover what kinds of personalities accept, and what kinds reject, such profound social changes as those embodied in "The New Deal." The investigation was sponsored by the American Council on Public Affairs and was assisted by grants-in-aid from the Social Science Research Council.

A highly reliable and internally consistent questionnaire on Political and Economic Progressivism, administered annually to all students, was the chief means of determining changes in social attitudes. It seemed to the reviewer that faith in the common man and belief in his right to have more of the good things of life should lead to a liberal, or as the author calls it, a "non-conservative" score. A personality questionnaire, interviews, and guess-who ratings were used in the studies of individual students. For comparison purposes, brief studies were made of the social attitudes of some students at Skidmore and Williams.

In all three colleges liberalism increased from Freshman to Senior years, but the change was more marked at Bennington and the students there were more aware of this trend. Liberal students, as contrasted with conservative ones, were more interested in public affairs, participated to a greater degree in the life of the campus, had more prestige, and showed more energy and enthusiasm. They tended to major in the Social Studies whereas the more conservative students were found to a slightly greater extent in the Science and Music departments. The conservatives were more closely tied to their homes and to small groups of friends. They tended to be indifferent to community concerns and to be critical of, or negativistic toward, the community.

Though liberal attitudes may have been assumed at first by the younger students as a means of achieving success on the Bennington campus, such attitudes attained considerable autonomy. Follow-up studies, continued for three years after graduation, showed a persistence of liberal attitudes in spite of conservative family and community pressures.

A wealth of data about the social attitudes and personalities of several hundred students, accumulated during the four years of this study, is thoroughly analyzed. The first third of the book (80 pages) contains over 30 tables. Detailed statistical treatment, however, is wisely placed in an Appendix. Many closely reasoned hypotheses are advanced to account for the trends indicated by the factual results.

The investigation was ingeniously devised to show not only the objectively determined roles students played in the community and their observable personality characteristics, but also their subjectively assigned roles and characteristics. The author felt that attitude changes could be understood only in terms of both these roles. On the basis of (1) the individual's awareness of his degree of conservatism, as objectively determined, and of (2) the extent of his cooperation with the community, both the liberals and the conservatives were divided into four groups: negativistic and aware, negativistic and unaware, cooperative and aware, cooperative and unaware. The members of each one of these subgroups tended to have certain personality characteristics in common and represented, therefore, one of four different liberal or conservative personality types. An interesting incidental finding in this connection was the general tendency for subjects to believe that their particular attitudes were more widely held than was actually the case.

Instructors in other colleges will view with envy the amount, if not always the direction, of the influence which the non-conservatively inclined Bennington faculty was apparently able to exercise over its students. Whereas most of the entering Freshmen in 1936 expressed themselves in agreement with the views they attributed to their parents, as in favor of the relatively conservative Republican candidate for President, 84% of the Juniors and Seniors favored either Roosevelt or one of the more radical candidates, Thomas or Browder. Bennington took young women from upper-class conservative homes, made them acutely aware of social issues and persuaded them to view these issues from a progressive standpoint. Verily, the *alma mater* did a thorough job of sociological and political weaning from the natural parents. What the latter may have thought of this process is another matter.

The author emphasizes the role played by the atmosphere of the community in producing such extensive and persistent attitude changes. Progressives were in the majority and in the saddle. The important people—the faculty, student leaders and upperclassmen—were emphatically progressive. The budding mores of the community were favorable to liberal and even to radical changes. In such a community it was the conservative who was out of step and who tended to be negativistic or critical.

In spite of its relation to this unusual setting, the book retains general significance because of its bold, pioneering character and because of the universal social importance of the problems with which it deals.

Antioch College. CLARENCE LEUBA.

REMMERS, H. H. and GAGE, N. L. Educational Measurement and Evaluation. New York: Harper & Brothers, 1943. Pp. ix+580.

A persistent problem confronting the educational administrator and classroom teacher is measuring and evaluating pupil changes. All too frequently educators have considered subject-matter changes to the exclusion of changes in total behavior. This book, on the other hand, emphasizes the importance of evaluating the whole or "organismic" individual from a guidance point of view. However, according to the Foreword, "The book makes no pretense of being a handbook for guidance. It is rather concerned with providing the methods and techniques for obtaining the facts and evaluative data necessary for valid guidance." Thus, there is an unusually extensive treatment of physical aspects, environment and background, emotional and social adjustment and attitudes in addition to the traditional content of measurement texts.

Part I attacks the theoretical problem of "What Should Be Evaluated" as a basis for guidance. Part II presents practical suggestions on "How to Evaluate" each of the various aspects discussed in the first section of the book. The authors seem much more comfortable and "at home" in the second part of the book than in the first. Could this be a reflection of their preference for psychological results as opposed to educational theorizing?

One is somewhat relieved to find a book about measurement which does not make a fetish of tests, even though many different kinds of tests are briefly described and weighed. Psychologists who have lamented the misuse of scientific tools will be pleased to find a text which reveals the major limitations of statistical analyses and encourages classroom teachers to interpret test results cautiously. The two chapters entitled "Interpreting Scores" are particularly well organized, fairly complete and clearly written.

Even though the reviewer agrees with the authors in considering attitudes important for evaluating pupils, it seems to him that more space has been devoted to attitude measurement than the topic merits. Some over-emphasis is, however, justified when one considers the number of similar texts which have ignored the importance of such measurements.

The book as a whole is a synthesis of many materials into an organized approach to meaningful evaluation. It may be used by almost every instructor of educational measurements as a text. In fact, classroom teachers could probably use it as a convenient handbook for selecting, constructing and administering evaluative devices. It is well written, carefully indexed and has a satisfactory format.

HOWARD L. SIPLE.

Northwestern University.

STERN, EDITH M. Mental illness: a guide for the family. New York: The Commonwealth Fund, 1942. Pp. xvii+134.

Mrs. Stern's book seeks to allay the fear, dread, and shame which usually afflict the relatives of the mentally ill.

The purpose of the book is accomplished by giving factual information about the many things which a distraught family wishes and needs to know. There is information about the process of commitment, the relative merits of public and private institutions, how to take the patient to the hospital, and what to do upon arrival. Life within the institution, its rules, and the more prevalent methods of treatment are described. The value of visits, letters, and appropriate gifts to the patient is emphasized. Frankness in all dealings with the afflicted person is encouraged; he is ill, not wicked. Avoidance of well-meant but usually worthless advice of neighbors is emphatically advised. Much helpful information about how to treat patients on parole or after discharge is given. Even though *continued care* (not custodial) is necessary, the family is urged to keep in contact and not give up all hope.

There are five appendixes containing much useful information regarding provisions for care of the psychotics throughout the United States. There is an index and a glossary of terms.

Though Mrs. Stern encourages more faith in the family physician than many will feel is justified and states some passages in ways which the psychologist will find objectionable on theoretical grounds, her book is eminently successful in its purpose. All who may have occasion to advise relatives of "those whom mental illness strikes" should have this book at hand.

STANLEY S. MARZOLF.

Illinois State Normal University.

ZILBOORG, GREGORY. Mind, Medicine and Man. New York: Harcourt, Brace and Co., 1943. Pp. viii+344.

This book is intended to steer to psychoanalysis the layman who is at a loss as to whom he should consult in case of mental illness and to clear away certain misconceptions in the layman's mind as to the nature of such illness and the source of treatment. In the author's opinion, the therapy of non-physical mental illness falls properly within the province of the psychiatrist—not within that of the neurologist, psychologist or clinical psychologist. The training of a psychiatrist includes—beyond traditional medical disciplines—"a systematic study of general psychology, literature, anthropology, sociology and history." In addition to this broader training there is the "therapeutic intent," a distinctive ingredient of the psychiatrist which comes during his interneship from the urgent need of alleviating illness everywhere present in the hospital. However, not every psychiatrist is qualified to handle non-physical mental illness which is defined as personality-disturbance with roots in the instinctual-emotional history of the individual. A type of psychiatrist known as a psychotherapist is needed. There exist psychoanalytic and non-psychoanalytic psychotherapists. Zilboorg's bias is for psychoanalytic psychotherapy of the Freudian stamp as alone being capable of curing more than symptoms. Of genuine Freudian psychoanalytic psychotherapists he estimates that there are hardly more than 250 in America.

After this lengthy prologue, the author reviews in limpid fashion the history and definitive shaping of Freudian psychoanalysis, a recital relieved from time to time by a defence of Freud against sundry criticisms. Only in the last two chapters dealing with crime, administration of justice and with religion does Zilboorg transcend his fealty to Freud. Here he stresses more fully than Freud the role of the death-instinct (aggression) in crime and judgment. In discussing religion, the author parts company with Freud by viewing it not as a compulsion-neurosis but as a triumph of the love-tendencies over the aggression-instincts.

The book as a whole is touching as a tribute and as a confession of faith on the part of an unsullied Freudian. Its thesis that psychoanalysis is the psychotherapy *par excellence* is not convincing to the reviewer who would like to see the case for the various non-psychoanalytic and neo-psychoanalytic psychotherapies handled with a semblance of equity. Zilboorg does not, as might have been hoped, rise like Hans Prinzhorn in "*Psychotherapie*" to the level of a philosopher of psychotherapies in quest of the cause of causes of neuroses and the principle of principles of psychotherapies.

F. C. SUMNER.

Howard University.

BOOKS AND MATERIALS RECEIVED

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ANON. When children ask about sex. New York: Child Study Ass'n of America, 1943. Pp. 16.

ANON. Report of the Coordination Committee. Div. for Delinquency Prevention. State of Illinois, 1943. Pp. 166.

ANON. Determining readiness for reading. Educ. Res. Bull. No. 6. Division of Tests and Measurements, Bureau of Reference, Research and Statistics. New York: Bd. of Education, Sept. 1943. Pp. 49.

NOTES AND NEWS

Joseph Jastrow, one of the most widely known psychologists of our time, emeritus professor of the University of Wisconsin, died January 8th, at the age of eighty. Following his retirement he actively engaged in writing in New York City. He was one of the founders of the APA, its first Secretary in 1892–93, and its President in 1900.

Robert C. Challman of the Psychological Laboratories, Norwich State Hospital (Conn.) has been appointed associate professor of psychology in the University of Connecticut on a part-time basis.

Charles Fordyce of the department of psychology, University of Nebraska, has been named head of the department of education and psychology at Nebraska Central College (Central City).

F. C. Bartlett, professor of experimental psychology in the University of Cambridge, gave the Huxley lecture of the Royal Anthropological Institute, London, on November 23, 1943. He spoke on "Anthropology in Reconstruction."

Wilford S. Miller, professor of educational psychology of the University of Minnesota, has been appointed acting dean of the Graduate School, to serve during the absence of **Theodore C. Blegen**, dean, who is in Washington on leave.

The Very Rev. **J. Willard Yoder** has recently been elected Dean of All Saints Episcopal Cathedral, Indianapolis, Indiana, having been vicar of St. Matthew's, extension lecturer in psychology at Butler University, and consultant in psychology at Eli Lilly and Company, Indianapolis. He is editor of the Diocesan paper, *The Indianapolis Churchman*, and of *The IACP News* (Indiana Association of Clinical Psychologists News).

Watson O'D. Pierce, who has been working with the War Department Manpower Board Field Survey in the Air Service Command, is now Test Construction Advisor, Training Section, Office of the Secretary of War.

The Psychology Laboratory of the Department of Neuropsychiatry of the Michael Reese Hospital of Chicago announces changes in its facilities for clinical psychology. Externeships are now available at two levels: senior, $900 per year on a three-fourths time basis with meals; junior, $300 per year on a one-half time basis with one meal. Appointees participate fully in the activities of the laboratory and work with the psychiatric and social service staffs in studying and treating patients. All externes are expected to learn the Rorschach test and participate in the research carried on with this and other psychological devices and instruments. Time and freedom are offered for advanced study in universities. Externes at the senior level are selected from among candidates with a minimum of one year's practical experience. Applicants at either level must be university graduates with a fundamental background in psychology. For information write to **J. S. Beck**, Ph.D., Head of the Psychology Laboratory, Michael Reese Hospital, Chicago.

NOTICE

In order to comply with the requests of the War Production Board for the saving of paper, the *Psychological Bulletin*, beginning with this number, will increase its line length from 25 to 27 picas and its page length from 43 to 45 picas. While the change is small, it represents a considerable saving in paper. The *Bulletin* feels that its readers will approve this contribution to the war effort.

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Psychological Bulletin

FACTORS RELATED TO VOCATIONAL INTERESTS*

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I. INTRODUCTION

Theories of interests have come down from the times of Plato, Rousseau, and Herbart, and more recently, from James, Spranger, Dewey, Burnham, Thorndike and Hall. When psychologists have become concerned with the affective aspects of activity, they have approached the problem with the concept of interests.

As in so many other fields, scientific activity in this field is accompanied by disagreement concerning definitions and terminology and by lucanae of knowledge essential for the completion of a theory of interests. The lucanae can be filled only by much investigation and study; the definitional and terminological problems solved only by discussion and agreement.

Definitions of interests have varied according to the systematic biases of the authors. As Fryer (**23**) says:

> The structural psychologist defined interest as feeling, an element of experience, or if not as a mental element, as a complex thought experience with a strong feeling component . . . . The functional psychologist brought in the dynamic factor and defined interest as a moving, habitual experience with ideas of future reference and with a strong feeling component.

William James (**31**) used attention as the main criterion of interest and this is still the definition of interests found in Warren's Dictionary of Psychology. In 1913 John Dewey (**15**) defined interests as "the accompaniment of the identification, through action, of the self with some object or idea, because of the necessity, of that object or idea for the maintenance of a self-initiated activity."

Another version of this definition, perhaps simpler, is given by Threlkeld (**59**).

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* This review was written before the appearance of the comprehensive and masterly volume by Strong (Strong, E. K., Jr. Vocational Interests of Men and Wômen. Stanford Univ., Cal., Stanford Press, 1943.) The author regrets that his Service obligations make impossible the inclusion of material from or comment upon that book and urges readers who are concerned with vocational interests to become familiar with its contents.

† On leave, in active service as Ensign, H-V(S) USNR.

> Interest is not some one thing; it is a name for the fact that a course of action, an occupation, or a pursuit absorbs the powers of an individual in a thoroughgoing way. But an activity cannot go on in a void. It requires materials, subject matter, conditions upon which to operate. On the other hand, it requires certain tendencies, habits, powers on the part of the self. Wherever there is a genuine interest, there is an identification of these two things.

The definition of interests which has obtained most agreement is that given by Fryer (23). Approaching the studies of interests while remembering this definition will perhaps assist in the reconciliation of divergent interpretations.

> During the last ten years—interests have come to be regarded as complex configurations of feeling experience . . . . The criterion of interest is thought of as the feeling.
>
> Interest stimuli are things which stimulate an individual to react with feeling. When there is a feeling aspect in the experience brought about by their stimulation the experience is an interest experience. The stimulus causing a pleasant experience is an interest. The stimulus causing an unpleasant experience is an aversion . . . . Subjective interests and aversions, then, are defined in terms of objects and activities stimulating the individual to have feeling experiences, and this experience can be estimated by the person being stimulated as to its qualities of pleasantness and unpleasantness, and as to the intensity or degree of feeling.

Almost inevitably, psychologists attempting to understand and predict human behavior must be concerned with the problem of interests. Abilities and interests are the co-determiners of achievement, whether it be vocational, educational or athletic. Predictions of performance in true-to-life situations based on indices of ability alone have been found inadequate. The use of interests in making these predictions offers much promise. Studies in interests are actually studies in motivation. The psychology of needs, goals, motivation, and interests presents a composite picture involving the entire affective aspect of behavior. The understanding of behavior requires a more complete knowledge regarding these problems. When the determinants of interests are more completely understood, the psychologist will have obtained keys to many of the hither-to unsolved riddles of personality. The educator, the psychiatrist, and the vocational counselor will then be able to incorporate this knowledge into their work and presumably operate on a more efficient level.

This review of the literature will attempt to summarize the information now available concerning the determinants of vocational interests and more important, to indicate gaps in this information. Many questions concerning vocational interests have been answered inadequately and many others have not been answered at all. The most recent* summary of the literature is found in Fryer's book, *The Measurement of*

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* See footnote on preceding page re Strong's new book.

Interests (23) published in 1931. Much work has been done since that time and many of the studies reviewed in that book have assumed new implications in light of recent investigations and developments.

The following sub-sections have been arranged according to whether the determinants considered are *relatively* intrinsic—age, sex, and ability—or whether they inhere in the individual's social framework or context—family, school and teachers, work experience, occupational information, hobbies and activities. None of these factors can be assigned wholly to the individual or to his social setting, yet the above classification will perhaps clarify the discussion.

II. DETERMINANTS INTRINSIC IN THE INDIVIDUAL

Sex and Vocational Interests

The studies reported by Terman and Miles (58), Strong (55), and Mead (36) give systematic substantiation to the laymen's observation that the interests of men and women do differ. This difference occurs when we consider vocational interests. The masculinity-femininity key of the Strong Vocational Interest Blank is based upon this sex difference. Occupational groups form themselves into a hierarchy of masculinity-femininity upon the basis of their measured interests.

The vocational choices of boys and girls are also characteristic of their sex. An unpublished study by Darley reveals the extent of this sex difference. In 1941, of 7791 boys graduating from Minnesota high schools, 17% had chosen engineering as their future occupation. Of the 10,603 girls, only .1% had chosen engineering. Of the boys, 4% planned on being teachers; of the girls, 19% chose teaching. Of the boys, .8% were planning on doing routine clerical work, of the girls, 3% were planning on doing this work. The general trend of the results would certainly be predicted by anyone familiar with our society. The explanations of these sex differences are less obvious.

A case study reported in detail by C. C. Miles (37) shows that a male pseudohermaphrodite reared as a female for over seventeen years maintained masculine interests as measured by the Terman-Miles M-F test and the Strong Test. On the Strong Test his masculinity-femininity percentile score was 61. On the M-F test he obtained thoroughly masculine total scores. Although there is little doubt that interests are influenced to some extent by social pressures, this single case suggests that sex differences independent of social pressures influence the interests characteristic of either sex (37).

The anthropological studies by Mead (36) place great stress upon the cultural mileau, but the temperamental differences she has described are not the same as the interest differences discussed here. An hypotheis bearing further investigation is that sex differences in interests are related to physiological or physical variables. In line with this a unique study by Sollenberger (**51**) on maturing boys has been reported. His groups were too small, 10 and 23, to permit his results to be conclusive, but the study is very suggestive. In using Furfey's Test of Developmental Age, Lehman's Play Quiz, and Pressey's Interest Attitude Test, he found some significant differences between boys with high male hormone content in the urine and boys with low male hormone content, holding age constant. The high content group was rated as behaving more maturely and received significantly different scores on the Furfey test. They were more interested in heterosexual activities, personal adornment, and strenuous competitive sports.

To what extent physiological differences such as this determine sex differences in interests, we as yet do not know. Neither do we know how physical structure and physiological variability are related to vocational interests. Are different somatypes characteristic of people having different vocational interests and do factors such as visual acuity, basal metabolism, and muscular strength influence the development of an individual's vocational interests?

Age and Vocational Interests

The influence of age upon vocational interests has been most thoroughly investigated by Strong (**54**) and the interest maturity scale of the Strong Vocational Interest Blank is based on the age differentials here present. As successively older groups of men were studied, their interests tended to become more esthetic, more cultural, less athletic, and more feminine.

Carter has studied the vocational interests, as defined by the Strong test, of high school boys and girls and has concluded that the Strong test is a useful measuring instrument with people in this age group (**8**). Measured vocational interests apparently reach a point of relative stability soon after physical and intellectual maturity. The changes that occur with increasing age are relatively slow and systematic. Perhaps, Strong has suggested, as men grow older, they become domesticated, and the changes in measured interests reflect this process.

Vocational choices of students also tend to become more realistic as the age of actual occupational embarkation is approached. As students start seriously to consider training requirements and limitations of ability, the vocational choices shift from the glamorous to the practical. Systematic longitudinal or comparative cross sectional studies to bear out this impression, however, are absent.

Ability and Vocational Interests

The conclusion reached by Fryer (**23**) in 1931 still is valid.

> Specialized interests have little relation to specialized abilities, either in the field of occupations or the field of education . . . . The relation between inven-

> toried interests and intelligence is negligible . . . the relation between mechanical interests and mechanical abilities appears also negligible.

Early studies, including those of Thorndike, showed a high relationship between interests and *estimated* abilities. These findings have not been verified with *tests* of abilities.

Strong (56) reports correlations ranging from +.38 to −.33 between 35 keys of the Strong Interest Blank and the Thorndike Intelligence Examination for High School graduates. Darley (12) reported correlation ratios from .04 to .31 with six representative keys of the Strong Interest Blank and the factor scores of the Tests of Seven Primary Mental Abilities. The median value of these 42 correlations was .09. In his twin study, Carter (7) reported a mean correlation of .10 between 23 keys of the Strong test and IQ. These correlations ranged from −.44 to .36. These studies using correlational methods to investigate the relationship between interests as measured by the Strong blank and verbal intelligence have consistently suggested that if abilities do influence measured interests, this influence apparently is not very great.

A study by Berdie (4) compared a group of 42 men having interest in engineering, as measured by the Strong test, with a group of 94 men not having measured interests in engineering. The scores of the engineering group on the American Council Examination were significantly higher than the scores of the other group but this difference was significant only at the 5% probability level. Comparisons of other interest groups revealed no other significant differences. Studies based on group comparisons will most likely substantiate the correlational studies.

Results based on other measures of interests and abilities are generally in agreement. Reed (43), using the Thurstone Vocational Interest blank and the Henmon-Nelson Intelligence test found low correlations which were not statistically significant. Garretson (24) and King (32) using other tests obtained the same results.

Some relationship is almost inevitable between ability and expressed vocational interests, although Hutson suggests this relationship is smaller than might be suspected. In a study (30) on approximately 2700 students in grades 7 to 12, he found,

> The median IQ of the boys who would enter the professions is but seven points higher than that of the boys who have chosen careers in the skilled trades . . . . Twenty-five per cent of the 417 boys who elect to enter the professions have IQ's below 98.4 while 25 per cent of the 411 electing the skilled trades have IQ's above 109.5. The girls' choices showed a similar distribution. Comparison of the interquartile range of IQ's of the boys with the figures adopted from the Army Alpha results, shows that among the workers in professions and in skilled trades there is no overlapping between the middle fifty per cent. The same groups of boys overlap by two-thirds.

When people make an occupational choice, they are usually forced to make an estimate of their own abilities. Hirsch (**28**) found a higher relation between estimated ability and expressed interests (what the child liked best) than between tested ability, as measured by various forms of the Binet, and expressed interests. The correlation between actual ability and interest was .20, between estimated ability and interest, .48. The statistical significance of this difference can not be validly determined, but in light of the size of the sample of 600, Hirsch's conclusions appear justified.

Although much evidence regarding the relationship between general abilities and interests suggests little association, little evidence is available concerning the relationship between special abilities and interests. Does the person with unusual ability in music, art, mathematics, speaking or writing have interests characteristic of those abilities? Endicott (**20**) found that 13 per cent of the 317 boys he studied checked that their vocational choice had been influenced by special ability. The keys on the Strong Interest test for musicians and artists suggest that the people in the standardization group who had sufficient ability to become successful in these vocations had characteristic measured vocational interests. This does not necessarily imply a general relationship.

Many questions remain to be answered concerning the relationship between abilities and interests. The available evidence indicates, however, that a person's ability is not a very important factor in determining his interests, and although a relationship can be found between the two factors, this relationship is so small that we must look further if we are to understand the sources of vocational interests.

III. SOCIAL CORRELATES OF VOCATIONAL INTERESTS

Sex, age, and ability are conditions not susceptible to social controls. Any influence these factors have upon vocational interests is relatively constant. Other factors related to vocational interests are not so fixed and exert their influence in a more socially controllable way. Familial influences, schools and teachers, etc., are all factors which are not intrinsic in the individual but rather components in his social framework. Like other aspects of personality, vocational interests are determined to an as yet unknown extent by these factors.

Family Influences and Vocational Interests

The family is the social group with which the individual has most direct contact. If familial influences determine personality, they are also likely to be determinants of vocational interests.

A recent study by Hirschberg and Gilliland (**29**) is representative of many studies upon familial similarity of attitudes. Correlations ranging between .25 and .66 were found between scores of parents and children on the Thurstone Attitude Toward God Scale, Stagner's Opinion about the Depression Scale, and Loma's Attitude Toward the New Deal Scale. A more comprehensive study by Remmers and Whisler (**44**) reports average correlations of .69 and .55 between attitudes of mothers and children and fathers and children, respectively. The scale used here was Remmer's Scale to Measure Attitudes Toward any Institution or Race and covered attitudes toward movies, sex education, schools, capital punishment, and divorce. This demonstrated similarity of attitudes may be due to exposure to mutual influences or due to a conditioning effect exerted by the parent's attitudes upon the attitudes of the children. Family resemblances of vocational interests may be similarly explained.

Many investigators have emphasized the influence of the family upon vocational choice (**20**, **25**, **34**, **38**, **41**, **46**, **60**, **61**). All of these authors state that the vocation of the parents, the wishes of the parents, or both have profound effects upon the vocational choices of students. Peters (**41**) states the family is the greatest single agency in determining vocational choice. The people in his study, as well as the people in the studies of Valentine and Ritchie (**61**) were asked to check the reasons lying behind their vocational choices. The results of these studies do not indicate reasons underlying vocational choices but rather reasons given by students as underlying their vocational choices.

A few investigators, however, have concluded that family factors are relatively unimportant in influencing vocational choices. Crouch (**10**) in studying the factors influencing the vocational choices of 33 problem boys and girls of adolescent age, concludes "although intellectual capacity, the occupation of the father, and the suggestion of their parents and friends played a role of some importance in the students' choice of vocations, unfavorable emotional influences and the stress of the adolescent period seemed to furnish more adequate explanations as to why they chose as they did." This study consisted of a clinical evaluation of complete case records and no statistical evidence is presented.

Anderson (**1**) conducted a study of 673 college men. Of 668 cases, 12% chose the occupation of their father, chiefly farming. Forty per cent had fathers who had made vocational suggestions and thirty-five per cent had mothers who had made vocational suggestions. Of the 267 cases whose fathers made suggestions, 27% accepted the father's suggestion in regard to vocations. Only about 1 student in 10, however, believed himself influenced by parental suggestion. These results are in close agreement with those of a similar study conducted by Bedford (**3**).

In a study of 550 boys and 537 girls, 8–17 years of age, Sheldon (**50**) found the occupation of the father had little influence upon the occupational choices of children. Nelson (**38**), in a study of 321 students of both sexes from 18 colleges, found a significant positive but low relationship between the occupational choice of the student and the vocation of the father. Monroe, in a study cited by Fryer (23), "studied the interests of 157 children up to 14 years in age. The majority of the fathers were laborers, yet only one wished to follow his father's occupation and over 50% wished to enter the professions."

These results appear to be in contradiction to another study cited by Fryer (23).

> Barnes . . . secured records of vocational ambitions from 2360 London Board School Children (1000 boys; 1360 girls), ages 8 to 13 years . . . . The children studied by Barnes were from the laboring and artisan classes. There would necessarily be, it would seem, some adjustment of the interests in this list to the practical opportunities. Thus, there are 55 per cent of the boys expressing their vocational interests in the occupations of artisan or laborer . . . . The averages show that there is about 50% realization of the children's (girls) vocational interests.

The above paragraphs suggest that all is not in perfect accord regarding the importance of the family upon vocational choices. Some investigators have claimed parental occupations, wishes and advice are important factors in influencing vocational choices. Others have claimed they are relatively unimportant.

Several reasons serve to explain these discrepant conclusions. Endicott (20) has discovered the existence of sex differences, girls being more influenced by parents. Kroger (34) in his study of 4543 high school boys, has discovered that parental influences vary with the father's occupation. "Sons of fathers in the higher occupations tend more frequently to be influenced by their fathers' occupations than boys whose fathers' occupations lie lower in the scale." We have already noticed how results may depend upon the method of determining reasons underlying vocational choices. Students, asked for reasons, as in Valentine's study, may give different reasons than those discovered through a clinical analysis, as was done in Crouch's study.

Results are also dependent upon the job classification used. Using broad classifications, as has been done in studies of occupational mobility (2, 6, 14, 47), the influence of the family upon vocational choices will perhaps appear greater than if specific jobs are considered. These studies of occupational transmission also show that the relationship between familial occupation and actual occupation is greater than between familial occupation and expressed vocational choice. We must be careful in distinguishing between vocational aspiration and actual vocation in such studies. This means the time factor is important. The closer the time of determining vocational choice to actual introduction into the occupation, the greater the influence of parental occupation will appear.

One additional explanation must be made concerning the discrepant results cited. Vocational choices are determined by many influences.

Often neither the student nor the investigator can determine how these influences should be classified or what importance should be attached to the various influences present in a given case. Thus (**60**), "A boy wrote that he wanted to be an engineer, but his father wanted him to take a clerkship, so, 'as it was the only job available, I took his advice'!"

The wisdom or appropriateness of vocational choices made under family influences has been questioned by some authors. Dyer (**19**) writes, "It is likely that decisions made in line with the family tradition and the counsel of relatives, teachers and friends should be subjected to unusually close scrutiny." He found that relatively few of 101 college men influenced by these factors remained in their chosen occupations for five years. Cunliffe (**11**) in a study of 535 students, found that the students with the least occupational information were those whose occupational choice had been influenced by advice of parents or family.

All of the above studies have concerned the effect of the family upon expressed vocational interests. Only a small number of studies are available on the effect of the family upon measured vocational interests. A study by Carter (**7**), using 120 pairs of twins, has demonstrated definite relationships between the interest patterns of twins. The average correlation for identical twins was +.50, for fraternal twins, +.28. Corrected for unreliability of the scales, these would be considerably higher. The correlation between intelligence and interests is not high enough to account for these correlations. Using the statistically more secure average of transformed "Z" does not significantly alter the results found by averaging the correlations. This suggests that familial similarity of interests is comparable to that found for other psychological data, particularly personality measurements.

Forster (**22**) gave the Strong Interest Blank to 125 pairs of male college students and their fathers. The coefficient of correlation between fathers and sons on 25 occupational scales ranged from .00 to +.48 with an average coefficient of +.33. Rank difference correlations between the occupational scores of the individual father and son pairs range from −.42 to +.95 with a median at +.66. The same coefficients for unrelated pairs ranged from −.56 to +.93 with a median at +.36. As a by-product of a study on another problem, Dvorak (**17**) found a relationship to exist between the measured interests of physicians and their sons. Berdie (**4**) found that high school graduates whose fathers were in the skilled trades tended to have measured interests, as shown by the Strong test, in scientific and technical fields and students whose fathers were in business tended to have measured interests in business. Apparently measured vocational interests are influenced by familial factors.

Parental occupations, desires and advice are not the only familial factors which might possibly influence interests, although they are the only ones which have been investigated. Some investigators have found relationships between other familial variables and measured personality traits. Although the results of several studies are not in agreement, they do suggest the possibility of other sources of interests. In a study of 802 children, using a test of moral knowledge, Maller (**35**) concluded "the size of the family correlates negatively with intelligence, moral knowledge ($r = -.23$), cultural background and with honest behavior." These relationships did not appear to be linear.

Hayes (**27**), in a study of 76 women college students, using the Bernreuter test, concluded " . . . family position may be associated with quite significant differences in personality. The more older siblings a subject had, as long as she had at least one, the more neurotic, the less self-sufficient and the less dominant she was likely to be."

On the other hand, in a study of 430 University men, Stagner and Katzoff (**52**), using the Bernreuter test, conclude, "The effect of family constellation should be considered as only a small portion of the continuous interaction which determines personality." Wiles and Noetzel (**62**) concluded, "Our studies suggest that ordinal position is not an especially significant factor in fixing a personality type or in establishing definite forms of difficulty in adjustment or in determining dominant attitudes and responses in human relations." Stuart (**57**) also found no consistent relationship between family constellation and personality adjustment as measured by the Colgate Mental Hygiene Test.

These apparently discrepant results may also be due to a variety of factors. Sex differences may exist. Tests of varying validity may give different results. Methods of expressing family constellations may determine results. Various aspects of personality may be influenced differentially by these factors. Any discussion of conditions associated with vocational interests should therefore take into consideration familial factors other than parental occupation, advice and desires.

One factor that should be considered is that of family occupation. Children raised in a home dominated by a certain occupation are likely to be influenced by that occupation. A boy whose father, grandfathers, uncles and brothers are physicians will perhaps have different vocational interests from a boy raised on a farm by a farmer father and a farmer grandfather and having farmer uncles and brothers.

Studies of occupational mobility (**14**) have demonstrated a tendency for families to remain on the same occupational level through three generations. Scattered descriptions of family pedigrees (**33**) have indicated a similar tendency for specific jobs to run in families. Family tradition is one important factor in determining the vocational interests of some people.

Parental education is perhaps another factor influencing vocational interests. The cultural level of the home is determined for the most part by the level of the parents' education. A child surrounded by fine paintings, good books, high-brow magazines, and intelligent discussions can be expected to develop different vocational interests from a child not exposed to these things. The family income may be similarly associated with vocational interests. The occupational level key of the Strong Interest Blank suggests these family factors are worthy of investigation.

The family undoubtedly has a profound effect upon the evaluative aspects of the child's development. His desires, his satisfactions, his dissastisfactions, his sense of values are all influenced by the family. The type of person he admires is often expressed by his vocational choice. The type of thing he desires is often the goal of his vocational plan. For these reasons the part the family plays in the students' affective life should be studied in an investigation of conditions influencing vocational interests. Family adjustment and family dependency may be important factors in determining these interests.

School and Vocational Interests

Students consider their vocational choices to be influenced by studies they take in school and by their teachers. One of the most stereotyped responses obtained in a school counseling program is in answer to the question why a boy desires to become an engineer. The response almost invariably is that the boy liked chemistry and got along well in mathematics.

Valentine and Ritchie (**61**) found that 32% of an unreported number of individuals gave as their reason for choosing a vocation the influence of a favorite school subject. In a similar study, Pinney (**42**) found that 128 students claimed school activities had influenced their vocational choice while 315 said they had not. Peters (**41**) found that 10% of his students checked their vocational choices had been influenced by teachers. Endicott (**20**) also found that 10% of his students checked that their teachers had been one of the two most important influences upon their vocational choices. Dyer (**19**) cautioned that the influences of teachers might not be altogether favorable.

The old question again arises. Does a pleasant experience in school influence the student in making a vocational choice or do both the pleasant experience and the vocational choice result from a personality which is particularly responsive to a related class of experiences. Possibly the pleasant, or unpleasant experiences serve to reinforce a preference or a disliking for a certain kind of work.

Many factors determine a student's liking for a course in school. Shakespeare (**49**) studied 4572 boys and 4555 girls, 10–14 years old, who ranked the courses in order of preference and gave the reasons for their liking.

> Generally the subjects which permit bodily activity on the part of the pupil are the more popular. There is a period in the life of the pupil, about eleven plus,

> when there seems some devotion to subjects where perceptible results may be obtained, when achievement in a subject has a great influence upon its popularity. Later the development of an interest extraneous to school brings a utilitarian idea which seems to influence popularity.

These same factors might influence vocational interests in a similar sequence.

Workers in secondary schools have attempted to influence the occupational interests of students by presenting them with occupational information through lectures, films, tours, and various other projects. Only recently has any evaluation of these attempts been made.

Remmers and Whisler (45) did a comprehensive study of the effects of a guidance program on students' vocational attitudes as measured by the Miller-Remmer's Scale for Measuring Attitudes Toward any Vocation. They studied the attitudes of two hundred and twenty-five 9–12 graders toward electrical engineering, aviation, farming, teaching, secretarial work, etc. They gave form A of the test, then introduced a guidance program of talks, case studies, dramatized interviews, and self-guidance tests. They then gave form B of the test. Scores were more favorable toward farming and less favorable toward secretarial work on the retest. The variability was greater after the program. The authors attribute this to greater heterogeneity caused by the given information breaking down stereotypes. Final attitudes were interpreted as being more realistic. Correlations of Form A and B ranged from .34 to .72, being low and positive. No control groups were used.

A study has been published by Stone (53) showing the influence of a series of courses in occupations upon the vocational choices of students. There were 118 college students in his experimental group who had various combinations of occupational courses and clinical counseling and 140 students in his control group. He found that although counseling alone or occupation courses alone did not greatly improve the appropriateness of students' vocational choices, the choices were more appropriate for those students who had been both counseled and in the occuaptions courses. Apparently occupational information obtained in the courses was effective in improving the students' vocational choices, although giving occupational information with no counseling was not.

Cunliffe (11) found that the best informed students were those who had studied occupations in school. Of 1211 students studied by Bedford (3), 58% said they knew the training required for their chosen occupation. Of the students in the schools offering vocational guidance, however, 73% said they knew what these requirements were.

Crapullo (9) studied the choices of 94 high school students in rural and city high schools in New York. Of these students, 22, or 23% did not know what duties were performed in the active practice of their chosen vocation. Not one student reported the study of occupations had influenced his choice of vocation. Pinney (42) found that 383 students professed knowledge of the required training for their chosen vocations while 60 said they did not know what this training was.

There appears to be but little relation between the occupational choice of a student and the occupational information at his command. This might be a function of the method of teaching vocational information. Occupational information considered independently from the interests and abilities of students may not influence their choices, whereas information presented in such a manner as to allow students to relate it to themselves may help them in wisely choosing a vocation.

No information is available concerning the occupational information possessed by an individual and his measured vocational interests. A theory propounded by Bordin (5) suggests a person's interest profile is in part a function of his idea of the occupations he has considered. If this is correct, the interest profile can be altered by giving occupational information. This hypothesis is now being tested. Regardless of this theory, many people obviously have measured interests similar to the interests of workers in a field of which they have never heard.

Vocational Interests and Work Experience

Students occasionally ascribe the source of their vocational interests to work experience they have acquired after school or during summer vacations. Pleasant or unpleasant experiences while doing a certain type of work influence a student's emotional response to that work and he may decide to attempt to continue in it or to leave it. Some girls will not consider teaching as a vocation because of difficulty they have encountered while teaching young children in Sunday School. Some boys will not consider business as a vocation because they found saleswork in a grocery store on Saturdays either too strenuous or too monotonous. Other boys wish to enter business because they particularly enjoyed a job they had in that field. Little specific information is available concerning the relation between vocational interests and work experience.

Students having the most vocational information were those who had made their vocational choices upon the basis of work experience and study of that occupation, according to a study by Cunliffe (11). It is probable they were also the people with the most appropriate vocational choice. In a study of 1211 high school students, Bedford (3) found that of the 88% who had chosen an occupation, 513 had previous vocational training or experience. Of these, 46.4% had chosen an occupation related to this training or experience. Of those who had chosen an occupation, 12% gave as a reason for this choice previous experience in that work. Pinney (42) in a study of 916 high school students, found that 74 students claimed their vocational choice had been influenced by summer employment and 369 said it had not been so influenced. The other students did not respond to this item of the questionnaire.

These studies suggest that work experience has some influence upon the vocational choices of students and also upon what they consider the reasons for those choices. There is no information, however, to suggest whether work experience influences measured interests or not. If measured interests are expressions of basic personality structures, it is not likely that relatively superficial work experiences would influence them. Some work experiences, on the other hand, can perhaps have profound effects upon personality, and might therefore be associated with measured interests. Work experience implies the student is obtaining information regarding job duties and requirements and becoming acquainted with working conditions and his reactions to these conditions. This constellation of experiences might be one of the determinants of measured vocational interests.

Hobbies and Activities and Vocational Interests

A student is usually able to exercise more selection in choosing a hobby or avocation than in choosing his work experience. For this reason we might suspect hobbies would bear a closer relationship to vocational interests than would work experience.

In a study of 380 high school seniors, Peters (**41**), using a check list, found that 4.7% checked their vocational choice had been influenced by hobbies. Compared to the influence of parents and relatives, teachers, friends, acquaintances and opportunity for study and employment, the reported influence of hobbies was not very great. Dyer (**19**) interviewed 101 college men and determined their occupational status 5 years later. He had originally determined the source of their vocational choice. He found that of those placing the sources of their choices in the following categories, the indicated per cent remained in the occupation for five years.

Boyhood hobby	90%
Boyhood occupation	86%
Family situation	84%
Classroom inspiration	75%
Counsel of friends	67%
Origin not clear	60%
Total	78%

Dyer concluded, "Hobbies and boyhood occupations are vital instruments of vocational selection." A ten year follow-up study of these people revealed the same trends (**18**).

As with work experience, few investigations have been reported on the relation between hobbies and measured interests. Many items on interest tests refer to hobbies and activities, so we can suspect that hobbies and activities do bear a close relationship to the results of those tests.

IV. PERSONALITY AND VOCATIONAL INTERESTS

Factor analyses have uncovered constellations of behavior which, considered in their entirety, constitute personality. Vocational interests are distinct but integral aspects of this personality structure. Studies of measured vocational interests have shown them to be associated with other personality dimensions in a systematic fashion. Commonly accepted occupational stereotypes suggest that expressed vocational choices are also associated with these personality dimensions.

Up to this point in the discussion of factors related to interests, most of the studies have concerned expressed vocational interests, or occupational choices. Relatively few of the studies have considered measured vocational interests. Studies concerning interests and other personality characteristics however have dealt mainly with measured interests and but little information is available regarding the relationship between vocational choices and other personality characteristics.

One study by Nelson and Nelson (40) has reported the relationship between the vocational choices of 3752 students and their scores on the Lentz Opinionaire on Radicalism, the Thurstone Scales toward *Sunday Observance*, *Church*, *God (a Reality)*, and *God (Influence on Conduct)*. Mean radicalism scores ranged from 36.92, S. D. = 6.75, for those who had chosen banking as an occupation, to 29.25, S. D. = 7.95, for those who had chosen journalism. The authors conclude,

> Students who have chosen as their vocation banking, dentistry, music and government service are more conservative, whereas the liberal attitudes are found among those planning on journalism, social work, law, and agriculture. Those choosing the ministry are the most religious and the most favorable to their college.

A more recent study by Berdie (4) showed that on the Minnesota Personality Scale, high school graduates choosing business as a vocation had significantly higher morale scores than students not choosing business and students choosing engineering had significantly lower social adjustment scores than students not choosing engineering. Students *choosing* engineering had significantly higher masculinity-femininity scores and significantly lower occupational level scores on the Strong Vocational Interest Blank than students not choosing engineering. Although the evidence is not abundant, there can be little doubt that people with different vocational choices can be differentiated upon the basis of other measurable aspects of personality.

Evidence is more plentiful concerning the relationship between measured vocational interests and other personality dimensions. In a study of 52 men, Sarbin and Berdie (**48**) found that groups differentiated upon the basis of certain interest patterns on the Strong test had significantly different profiles on the Allport-Vernon Study of Values. Correlations ranging up to +.45 between the Allport-Vernon test and the Strong test were found by Duffy and Crissey (**16**) using 108 college women as subjects. These results have been verified in a more recently reported study by Ferguson, Humphreys, and Strong (**21**).

The relationship between measured interests and other personality test scores has been investigated by Darley (**13**). Using 1000 pre-college and college men as subjects, he found that groups with different interest patterns on the Strong test could be differentiated upon the basis of scores on one or more of the following scales:

Economic Conservatism of the Minnesota Scale for the Survey of Opinion.
Social Adjustment of the Bell Adjustment Inventory.
Social Preferences of the Minnesota Inventories of Social Attitudes.
Social Behavior of the Minnesota Inventories of Social Attitudes.

In another study of 577 college freshmen, Darley (**12**) found correlation ratios ranging from .05 to .41 between the five scores on the Minnesota Personality Scale and six representative keys of the Strong test. Of the 30 correlation ratios, 10 were large enough to indicate a statistically significant relationship. Five of these were between the Social Adjustment section of the Personality Scale and the Strong test. These were:

Chemist's Key	.16
Carpenter's Key	.25
YMCA Secretary's Key	.30
Life Insurance Salesmen's Key	.41
Lawyer's Key	.16

Darley's study indicates a substantial relationship between measured sociality factors of personality and measured vocational interest and supports Strong's suggestion that one of the factors measured by the Strong Interest test might be related to social behavior.

Students having "A" on the teachers' key of the Strong test had significantly higher adjustment scores on the Thurstone Personality test and higher extrovert scores on the Laird test than students having "C" on this key, according to a study by Goodfellow (**26**) on 172 students in education. These results are in agreement with the results obtained by Berdie (**4**) in comparing students having an interest pattern in the social service fields on the Strong test with students not having this pattern. On the emotional adjustment key of the Minnesota Personality

Scale, the group with the interest pattern had a significantly higher mean score than the other group, the critical ratio being 3.47.

The available information supports the statement that both measured and expressed vocational interests are consistently related to independently determinable aspects of personality. At the present time, interests cannot be attributed to these other personality characteristics. Rather, they should be regarded as an expression of a basic personality structure, susceptible to the same influences as are other expressions of that structure.

V. CONCLUSION

Vocational interests, both as measured by tests and as indicated by occupational choices, are expressions of liking and disliking as directed toward activities, objects and characteristics of the environment. The available information suggests that vocational interests, while being relatively independent of conditions residing in the social environment and of conditions intrinsic in the individual, are still a function of these conditions. No one factor—ability, school, or work experience—plays a large part in determining vocational interests, yet all of these factors are related to interests to some extent. As personality is a complex phenomenon resulting from a multiplicity of conditions, so are vocational interests.

The studies reviewed indicate that family influences are among the more effective factors determining interests and that abilities are among the least effective factors. Conditions associated with the individual's school life, if adequately manipulated, can perhaps be influential in determining interests. The importance of organic and physiological differences in explaining vocational interests is a problem almost completely neglected.

The relationships between vocational interests and other personality manifestations present many intriguing problems. When interests are considered as expressions of liking and disliking, attention can be paid to the objects liked or disliked. These objects form constellations; they have certain characteristics in common that enable us to place them in classes. Such constellations might be found in athletic activities, or artistic endeavors or acquisitive proclivities. A factor analysis of the Strong test would show a definite clustering. Thus persons liking tennis might also like squash or at least, not dislike it. Persons liking talkative people would not express a preference for quiet people.

The general outlines of these constellations remain relatively constant and they may be considered as fundamental aspects of personality. The specific interests, or objects involved in the constellations may change and superficial learning and emotional experiences may affect them. The constellations, or patterns of interest, are not as susceptible to these experiences and are perhaps determined by constitutional and early social factors.

Viewing interests in this light leads to a hypothesis. A process of generalization, which may or may not be verbalized or of which the person may or may not be aware, might play an important part in the development of these constellations or interest patterns. A boy who has had one unpleasant experience on an athletic field, say playing football, might generalize his dislike for football to other team sports, perhaps soccer. This generalization may be justified by further experiences on the soccer fields. On the other hand, the boy may actually be forced into playing soccer, and then discover he likes the game. Experience in this case may prove the prior generalization was fallacious.

These interest patterns are not as likely to be influenced by fleeting experiences as they are by conditions and situations enduring over long periods of time. An accident on a football field is not likely to cause the average boy to develop a distaste for football, but a series of such mishaps, accompanied by constant discouragement from parents and friends and greater emphasis placed by them upon other activities may result in a dislike for the sport. These continuing and enduring situations are the conditions determining not only those things liked and disliked by the individual but also many other of his personality characteristics and behaviors. The stability of interests and of personality is perhaps due to the relatively constant battery of stimuli surrounding the individual as well as to his genetic constitution.

Little doubt can exist that genetic factors do determine personality to some extent. Recent investigations of the effect of the glands upon personality, as well as studies of temperament in animals show that much behavior is related to factors we know are inherited. Interests are also determined to some extent by inherited factors, if only in so far as these factors determine sensory and attentive limens. Although a concept of the inheritance of specific interests appears somewhat ridiculous, when interests are conceived as personality patterns, this concept is more acceptable. A person may not inherit the ability to speak French but he may inherit something which determines whether or not he will be able to learn French easily or whether or not he will learn French more easily than Greek. A person does not inherit an interest in being a teacher but he may inherit something which will influence him to have an interest in types of work involving social contacts.

When vocational interests are considered as aspects of personality or in their relationship to jobs and occupations, the paucity of available information is apparent. Longitudinal studies, systematic clinical studies and extensive correlational studies are needed to supply the information so necessary for a more thorough understanding of the phenomena of vocational interests.

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ON "THE ANALYSIS OF VARIANCE IN PSYCHOLOGICAL RESEARCH"

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Analysis of variance and kindred techniques developed by Fisher and his co-workers will very likely become valuable statistical tools in psychological research. Most of the psychologists who will use the analysis of variance cannot, however, be expected to follow in detail the mathematical developments lying behind the techniques involved. It may, therefore, be expected that psychological statisticians who attempt an authoritative presentation of such a technique to their less statistically sophisticated colleagues will: (a) provide a clear statement of the objectives of the methods, and (b) either restrict cited examples of use to those in which the methods are correctly used, or point out the errors in the analyses cited as models and examples.

In a recent article on "The Analysis of Variance in Psychological Research" (9) the emphasis is such as to obscure the primary objective of analysis of variance, and in addition, several experiments are uncritically cited although they violate major assumptions upon which the methods are based.

The aim of the present review is to clarify certain points in the original article and to correct major errors. Some of the minor slips may be pointed out in passing, but attention will be chiefly directed to more fundamental statistical inaccuracy. The review will follow the form of the original article.

I. MEANING OF THE ANALYSIS OF VARIANCE

The emphasis of the first section of the Garrett and Zubin article is misleading, and references are cited in which analysis of variance is inappropriately and inaccurately used.

Garrett summarizes the section by stating that " . . . no matter how complex the final analysis, the breakdown of the total variance into components and contributing variances is the essential objective of the method." This is like saying that the essential objective of finding a correlation coefficient is to compute the sum of cross-products. The impression is given here and in other sections of the article that the primary purpose of analysis of variance is to divide the total variance into two or more components (the mean squares) which are to be interpreted directly as the respective contributions to the total variance made by the experimental variables and experimental error. Actually analysis of variance techniques are primarily concerned with *testing the significance of variation* that can be traced to known sources (**10**, **5**, p. 62 ff.). It is possible, of course, to estimate the proportional contribution of different components to the total variance using the analysis of variance mean squares, but the process of *estimation* must be clearly differentiated from the test of *significance* (**10**). Rubin-Rabson (**19**) and Roff and Roff (**18**) confuse the two, and this, unfortunately, is not pointed out by Garrett when he cites their experiments as illustrative of the proper use of the analysis of variance.

The exact nature of analysis of variance and the assumptions upon which it is based may better be understood in the light of a concrete example. Suppose an experiment is to be carried out to discover the effects of method of learning upon the recall value of nonsense syllables. The variate would be some measure of recall; *e.g.*, number of syllables correctly given. Suppose that $N = rn$ subjects are used and that these subjects are assigned at random to r experimental groups; a different method of learning is used with each group. Thus there will be n subjects to each group. A recall score, X, is obtained for each subject; a mean recall score, $\bar{X}_i$, is computed for each of the r experimental groups; and a general mean, $\bar{X}$, is computed for all N subjects. Using this simple experimental design, three mean squares may be computed, one based upon variation *between the group means*, one based upon variation *within the groups*, and one based upon the two of these together. Such an analysis is presented in Table I.

TABLE I

SCHEMA FOR THE ANALYSIS OF VARIANCE WITH SIMPLE CLASSIFICATION OF VARIATES

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square or Variance Estimate
Between Groups	$n\Sigma(\bar{X}_i - \bar{X})^2$	$r-1$	$V_B \rightarrow^* n\sigma_B^2 + \sigma_p^2$
Within Groups	$\Sigma(X - \bar{X}_i)^2$	$r(n-1)$	$V_W \rightarrow \sigma_p^2$
Total	$\Sigma(X - \bar{X})^2$	$N-1$	

* The arrow indicates *expected values*.

In Table I, it is shown that the "sum of squares" *between groups* is n times the sum of the squared differences between the group means and the general mean, and the "sum of squares" *within groups* is the sum of the squared differences between the individual scores and their respective group means. When divided by the appropriate number of degrees of freedom, each "sum of squares" becomes a mean square, V_B and V_W. *The mean squares are not variances in the ordinary meaning of the term.* On the assumptions of: (a) random sampling, and (b) homogeneity of the group variances, the mean squares have expected values as indicated in the right-hand column of Table 1, where σ_p^2 is the population or universe variance of the variate, and σ_B^2 is the universe value of the variance between group means. Thus σ_B^2 is a measure of variation due to the experimental variable,—method of learning.

Using the common critical ratio technique, one would test the group means by pairs to see in each instance whether the hypothesis of a 'true' (universe) difference of zero would hold. In the above analysis of variance the same null hypothesis—no true variation between group means—is made. In other words, it is hypothesized that $\sigma_B^2=0$, and therefore V_B reduces to σ_p^2 and should equal V_W within the limits of random sampling variation. If a third assumption then holds; namely, that the universe distribution of the variate is normal, the sampling distribution of the ratio of the *between* to the *within groups* mean squares is known. The sampling distribution of the ratio of two independent, unbiased estimates of the same universe variance is tabled as the "F" distribution (**21**). If the experimentally obtained ratio is too great to be included within prescribed limits of the sampling distribution of "F," the hypothesis that $\sigma_B^2=0$ is rejected. Hence it is seen that as a test of significance this simple form of analysis of variance turns out to be an extension of the critical ratio or *t*-test so that the differences between several means are simultaneously tested.

In the Roff and Roff study (**18**) cited by Garrett, a slight modification of the simple design given above was used, but Roff and Roff made the error of comparing directly the sum of squares from between group variation with the sum of squares from within group variation to find whether differences between groups or differences within groups provided the greater portion of the total variation in their data. They would have been more nearly correct had they used V_W as representative of variation within groups; to obtain the between groups variance (σ_B^2), V_W should have been subtracted from V_B and the difference should have been divided by the average number of cases per group. The procedure and interpretation is outlined by Tippett (**23**, pp. 126–130).

II. SIMPLE CLASSIFICATION OF VARIATES

The writers should be pleased to discover that "F" and "z" have for some time been tabled for the .20 and .001 confidence levels (**7**) in addition to the .05 and .01 levels mentioned on p. 236. (More recently Merrington and Thompson (**15**) have presented tables of "F" for the .50, .25, .10, .05, .025, .01 and .005 levels.) They will not, however, find tables to evaluate the "F" of .5 which they computed from Schrader's (**20**) data, given on p. 238. "F" is so defined that it must always equal or exceed unity.

On p. 239, an analysis of variance based upon percentile scores (**17**) is presented without pointing out that it violates one of the basic assumptions of the method; *i.e.*, normality of the universe distribution of the variate! Such unnecessary violations should be discouraged even though it has been shown that the "F" test is not necessarily seriously invalidated by non-normal universe variation (**16, 4**).

Certain difficulties have been pointed out with reference to Dressel's (3) analysis (11), but these are not cited in discussion of the Dressel study on p. 239.

III. MULTIPLE CLASSIFICATION OF VARIATES

The exact character of the analysis of variance when the variate may be classified into more than one set of groups can be illustrated in terms of an example. The experiment outlined earlier on the recall of nonsense syllables becomes more general if k different nonsense lists are used. Each single list is then learned by all r methods, and rk subjects are assigned at random so that each subject learns a single list under a single condition. If the simple form of analysis of variance described above were used, the *within groups* mean square would be inflated by any variation in level of difficulty among the k lists. Thus V_W would tend to exceed rather than to equal the universe variance. Multiple classification, however, removes the influence of list heterogeneity from the data, permitting an unbiased estimate of σ_p^2.

The recall scores are arranged in k columns, one for each list, and r rows, one for each method, so that the score in the ith row and jth column belongs to the subject who learned the jth list by the ith method. If row means are denoted by $\overline{X}_{i\cdot}$, and column means are denoted by $\overline{X}_{\cdot j}$, the resulting analysis of variance is as given in Table II. On the assumptions of random sampling and homogeneity of variance for both rows and columns, the mean squares have expected values as indicated in the right-hand column of Table II. Here, σ_r^2 is the 'true' variance of

TABLE II

SCHEMA FOR THE ANALYSIS OF VARIANCE WITH MULTIPLE CLASSIFICATION OF VARIATES

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square or Variance Estimate
Row Means	$k\Sigma(\overline{X}_{i\cdot}-\overline{X})^2$	$r-1$	$V_R \rightarrow^* k\sigma_r^2+\sigma_p^2$
Column Means	$r\Sigma(\overline{X}_{\cdot j}-\overline{X})^2$	$k-1$	$V_K \rightarrow r\sigma_k^2+\sigma_p^2$
Interaction (Residual)	$\Sigma(X-\overline{X}_{i\cdot}-\overline{X}_{\cdot j}+\overline{X})^2$	$(r-1)(k-1)$	$V_I \rightarrow \sigma_p^2$
Total	$\Sigma(X-\overline{X})^2$	$N-1$	

* The arrow indicates *expected values.*

row means, and σ_k^2 is the 'true' variance of the column means. The new mean square, V_I, is the residual or intraction mean square. It is based upon variation remaining in the data which cannot be accounted for in terms of the variations in the row and column means. As indicated in Table II, V_I tends to equal the population variance.

With the further assumption of normality of the variate in the universe, the "F" test may be used, as in the instance of simple classification, to test the hypotheses that σ_r^2 or σ_k^2 are zero. In each case, "F"is the appropriate mean square divided by V_I.

Rubin-Rabson (**19**), cited by Garrett in Section I, used a multiple classification (somewhat more complicated than the above example). She erroneously compared directly the mean squares for her variables (individuals, methods, compositions, order, and residual) as measuring the relative contribution of each to the total variability. This assumes that a given mean square—*e.g.*, that for "methods" approximates the variance of the method means. Actually, as may be deduced from Table II, Rubin-Rabson's "method" mean square approximates $n\sigma_m^2+\sigma_p^2$, where n is the number of measures taken under each method, σ_m^2 is the "true" variance of method means, and σ_p^2 is the population variance of the variate involved. Hence it should be immediately apparent that the size of each mean square is as much a function of the number of items within each class of a classification (*e.g.*, r and k, in Table II) as it is a function of variability in means.[1]

On p. 242, Garrett cites his own study (**8**) in which an invalid test is made of the relative strengths of "practice variance" and "subject variance." The desired null hypothesis is that the universe values of "practice variance" and "subject variance" are equal. Unfortunately, however, the "F" ratio of "practice" to "subject" mean square does not provide a test for this hypothesis. The reason is the same as that given in connection with the Rubin-Rabson study above. It is as though the row and column mean squares of Table II were being compared. As can be seen in the right-hand column of Table II, the relative sizes of these mean squares is largely dependent upon the relative sizes of r and k; hence, the "F" ratio would be large or small depending as much upon the relative magnitude of r and k as upon differences in the varibility of the row and column means.

The logical structure of the analysis of variance is such that for an "F" test to be valid, one of the mean squares must be an estimate of the population or error variance.

IV. THE LATIN SQUARE AND THE GRECO-LATIN SQUARE

For completeness, Zubin's section on the Latin Square and the Greco-Latin square needs a reference to the Fisher and Yates tables (7). This volume includes sets of the most useful standard Latin squares together with instructions on how to generate and select random Latin and Greco-Latin squares. Zubin's point on the necessity for transforming percentages used in the analysis of variance is well-taken and might have been considered elsewhere in the article. The arcsin transformation which Zubin proposes, however, has the disadvantage of a non-normal sampling distribution when p differs from .50.

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[1] This obviously assumes that there is "true" variation in the means; *i.e.*, $\sigma_m^2\neq 0$.

V. FACTORIAL METHODS

Garrett's section on factorial methods is generally adequate. For the benefit of the unsophisticated, however, a reference to Fisher's *Design of Experiments* (**5**) would not be out of place, inasmuch as this book is a primary source of much of the material on factorial designs.

Crutchfield and Tolman's (**2**) enthusiasm for their factorial design (cited, p. 248) should have been curbed a trifle. The use of 243 animals permits evaluating each of the five single factors and the 10 two-factor interactions with the same accuracy that would have been obtained had separate groups of 195 (instead of 243) animals each been used for each comparison in the separate experiments. This follows because the error estimate is based upon 192, not 240 degrees of freedom (*cf.* p. 247).

VI. THE APPLICATIONS OF ANALYSIS OF VARIANCE TO CERTAIN SPECIAL PROBLEMS

1. *Reliability of mental tests.* The section on application of the analysis of variance to the determination of test reliability is distinguished by a notable absence of references to original sources listed in the bibliography. On p. 249, the statement that if " . . . F_2 is significant, the test is a good measuring instrument, at least to the extent of separating individuals one from the other" is a bit too optimistic in the light of the facts. Using the F_2 test proposed by Garrett with enough forms of the test and enough subjects, significance of F_2 might be shown where the reliability coefficient was less than .20, a figure which is rather lower than most psychologists' reliability requirements for a "good measuring instrument."

On p. 251 it is stated, presumably following Jellinek (**12**), that a high intra-class correlation coefficient tells more about reliability than does a high inter-class correlation coefficient. This is a matter of interpretation. Sometimes it is necessary to measure reliability in terms of the correlation between two forms of the same test. This often involves some unavoidable practice effects increasing the general level of performance on the second test, and in this situation the interclass correlation coefficient, eliminating the practice effect, may give a truer picture of the consistency of measurement than the intra-class r. In other words, each coefficient has its own interpretation, and each still has its use.

4. *Item selection and validation.* In outlining Baker's (1) plan for evaluating test items, Garrett fails to heed Zubin's (p. 244) caution against the use of untransformed percentages in the analysis of variance.

VII. ANALYSIS OF COVARIANCE

The presentation of Zubin's section on the analysis of covariance is accurate in essentials. The reviewer does feel, however, that the lengthy paragraph differentiating between analysis of variance and factor analysis would have been unnecessary if Garrett and Zubin had been more cognizant of the fact that analysis of variance is primarily a technique to test the significance of variation rather than a method for "separating total variance into components." As it is, the distinction between the techniques is so great and so obvious that a lengthy discussion of the differences seems a trifle ridiculous.

A few points in the summary paragraphs are worthy of some critical attention. On p. 265 homogeneity of row and column variance is proposed as a suitable criterion for the adequacy of random sampling. Although homogeneity of variance must be assumed in analysis of variance, homogeneity alone provides no proof of the adequacy of the sampling.

Under "*Secondly*" on p. 265 it is suggested that the variability of data in which a single individual's score appears more than once ". . . must be separated into two parts: inter-individual and intra-individual variance." Of course, analysis of variance does not separate variance into parts. For this reason, and for reasons beyond the scope of this review the problem of repeated measurements on the same individual cannot always be solved simply by computing a mean-square for individuals. In some instances the proposed procedure leads to a very puzzling situation. An (interaction) estimate of the population variance may appear to be based upon many more degrees of freedom than there are independent measures in the raw data. This situation occurs in the cited study of Rubin-Rabson (**19**).

Under "*Thirdly*," it is bluntly stated that classification criteria must be independent in order to obtain an error estimate in the analysis of variance. If this were true it would lead to the following interesting paradox. In many instances, correlation between the classification criteria is discovered only when the interaction mean square is found to be too large. But if there is no error estimate available, how is it possible to find a significantly large interaction? The answer is that an error estimate may always be obtained from replications of the experiment with *additional* subjects (*cf.* **21**, p. 40 ff.) even though classification criteria or classification variables are correlated.

The generally enthusiastic tone of the article is well illustrated by the closing paragraph in which it is cheerfully stated that Pearson (**16**) has concluded that "even when *some*[2] of the above requirements are not rigorously adhered to, the results of the analysis may still be meaningful." Pearson's study dealt with only *one* of the "above requirements", normality of the universe distribution of the variate!

In concluding, a few positive suggestions may be made. The psychologist who intends to use analysis of variance (or any other statistical technique) should acquire a thorough understanding of the method, preferably under expert guidance. General sources, other than Fisher (**6**), which the reviewer would recommend as giving understandable and accurate accounts of analysis of variance include the books of Tippett (**23**), Snedecor (**21**, **22**), and Lindquist (**13**). Of these, the last named, though plagued by minor errors,[3] is essentially accurate and should be understandable to almost any patient reader. Walker's article (**24**) on degrees of freedom is very helpful on that concept. More precise and deeper understanding of analysis of variance may be gained from Irwin (**10**), but this reference requires considerable mathematical background in the reader. Finally, although the reviewer believes that widespread use of statistical methodology should be encouraged, he would suggest that an *understanding* of the relevant chapters of Fisher's *Statistical Methods for Research Workers* is not too strict a prerequisite to actual *use* of these methods.

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[2] Italics mine.

[3] Which have been corrected in McNemar's review (**14**) and on the lithographed list of corrections provided with the book.

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PSYCHOLOGY AND THE WAR

Edited by

DONALD G. MARQUIS

CONTENTS

PLACEMENT TESTING OF THE CIVILIAN PERSONNEL IN THE AIR SERVICE COMMAND, by *Roger T. Lennon*.................. 167

THE PERSONNEL CONSULTANT IN AN ARMY TRAINING CENTER, by *G. M. Gilbert*.......................... 180

THE WORK OF PSYCHOLOGISTS IN THE NINTH SERVICE COMMAND SPECIAL TRAINING CENTER, by *Hugh M. Bell* and *William D. Altus*.......................... 187

PLACEMENT TESTING OF THE CIVILIAN PERSONNEL IN THE AIR SERVICE COMMAND

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The Air Service Command was established as a separate division of the Army Air Forces in October, 1941. The function of this Command is to provide for the maintenance and repair of the planes and equipment of the Army Air Forces, and to arrange for the procurement and distribution of the services and supplies necessary for this maintenance and repair. Since November, 1942, Major General Walter H. Frank has been Commanding General of the Command. In the continental United States, the work of the Command is carried on through eleven major repair bases, or depots, and their satellite installations. Civilian employees of the Command throughout most of 1943 numbered more than 280,000. Roughly 40% of the employees are engaged in maintenance and repair work, 30% in clerical, administrative, or professional work, and the remainder in miscellaneous other types of work—firefighters, guards, packers, laborers, supply, etc.

The Personnel and Training Division, Headquarters, Air Service Command, of which Brigadier General E. E. Adler is Chief, is in charge of all matters pertaining to personnel. For civilian personnel, such matters are handled by the Civilian Personnel Section of this Division under Colonel Joseph L. Whitney. The Classification Branch of this Section is responsible (1) for allocation of the civilian employees to the proper service and grade, in terms of their duties and responsibilities; and (2) for the development and administration of testing programs for improving the placement of the employees. This latter function is performed by a Placement Testing Unit, which has been in operation since March, 1942. The purpose of this paper is to present a general description of the Work of this Testing Unit; no attempt will be made to set forth the details of any of its research projects, nor to summarize all the data accumulated.

Functions of the Testing Unit. The work of the Testing Unit embraces the following four functions:

(1) The development of aptitude, trade information, performance, and such other tests as prove helpful in the proper placement of civilian employees, and the adaptation of tests produced by other agencies, to meet Air Service Command needs.

(2) The establishment of testing programs in the major depots, and the training of personnel in these depots in the administration of the programs. In some instances members of the Headquarters staff have been permanently detailed to the depots to direct the programs there.

(3) The coordination of the testing programs conducted in the various depots, and summarization and analysis of data from all the depots. In this connection the unit serves as a clearing house* through which the data and experience obtained in any one depot are made available to all the other depots.

(4) Provision of advisory service to depots and sub-depots, either through personal consultation or correspondence.

The services of the Testing Unit are made available to all interested groups within the Command, including employment officers, training officers, supervisors, employee relation counsellors, and others. The Headquarters staff has numbered at times as many as 16 technicians, all but two of whom have had training in psychology and/or experience in test construction. At present, however, there are only five staff members, due to transfers of technicians to depots, losses to the armed services, and other reasons. Practically all the test construction work to be described hereafter was carried on at Headquarters, Patterson Field, Fairfield, Ohio, although most of the subsequent research on the tests was conducted in the depots. At the time of writing, the Headquarters technical staff includes Dr. Brent Baxter, Mr. Claude Bridges, Mr. Edward Sait, and Miss Evelyn Potechin, in addition to the author. The directors of testing programs in the depots include the following:

Dr. J. S. Karslake, Warner Robins Air Service Command, Macon, Georgia.
Mr. G. G. Lane, Spokane Air Service Command, Spokane, Washington.

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* It should be mentioned here that in at least two depots, testing programs had been in operation independently of, and prior to, the establishment of the Testing Unit at Headquarters; both of these independent programs produced much worthwhile test material and research. Provisions have been made for integrating their work with that of the Headquarters Unit. This report, however, will be concerned only with projects initiated by or conducted under the supervision of, the Headquarters Unit.

Dr. Vernon Larsen, Ogden Air Service Command, Ogden, Utah.
Mr. W. Woodworth, Rome Air Service Command, Rome, New York.
Mrs. L. Hart, Sacramento Air Service Command, Sacramento, California.
Mr. J. Banarer, San Bernardino Air Service Command, San Bernardino, California.

With this brief overall summary of the functions of the Testing Unit in mind, it is possible to proceed to a more detailed consideration of some phases of the work. Since the work of test construction, or adaptation of already existing tests, was one of the first activities undertaken by the Unit, it may be well to discuss this phase of the work, under two headings—first, the construction of tests for initial placement of incoming employees, which may loosely be termed the "aptitude test" program; and secondly, the construction of trade information and performance tests designed for use in upgrading shop employees who have been in the service for some time.

Aptitude Test Program. The aptitude test program has included the development of tests for use in the initial placement of both mechanical and clerical workers. Because of the war-induced manpower shortage, the vast majority of individuals hired for aircraft maintenance and repair positions were inexperienced in aircraft work, and included a large percentage of women workers inexperienced in mechanical work of any kind. In order to avoid waste of considerable time and expense in training individuals who would eventually prove unsuccessful on the job, and to make the best possible utilization of the available labor supply, there was need of some means of indicating the approximate level and kind of work for which an individual was qualified. For this purpose, a series of tests was developed, intended to predict success in mechanical work. Following a review of the available tests and of the literature, including the experience of other War Department agencies faced with a similar problem, and after observation by the staff of the actual work carried on in the depots, and consideration of the job breakdowns provided by the classification analysts, a group of tests was produced, constituting a series of so-called "Selection Tests," as described below:

Selection Test 1 is a 38-item test made up of a series of figure analogies, intended to measure one aspect of non-verbal intelligence. The test requires 15 minutes working time, plus about 5 minutes for directions. The educational level of many of the applicants was so low as to handicap them unduly on the usual verbal-type intelligence test, so that some non-verbal intelligence measure seemed desirable.

Selection Test 2 is a 60-item non-verbal test, intended to measure ability to perceive details of size and shape. Working time on the test is 16 minutes.

Selection Test 3 is intended to measure the ability to visualize the order in which parts must be fitted together in order to form a pictured solid, and the ability to visualize the solids that could be formed from an assembly of several pictured parts.

Selection Test 4 was intended to measure ability to understand mechanical movements, and to recognize the kind of mechanism required to produce specified kinds of motion. This test proved too difficult for the level of applicants, and was abandoned after a few initial tryouts.

Selection Test 5 is intended to measure the ability to visualize how parts of figures fit together into wholes. The test includes 48 items and requires 12 minutes working time.

Selection Test 6 is a test of mechanical information and understanding of mechanical principles, made up partly of verbal and partly of pictorial material. It includes 77 items and has a working time of 25 minutes.

Selection Test 7 is also a test of familiarity with mechanical objects and devices of greater difficulty than Test 6, and of a less general nature. It includes 62 items, and has a time limit of 20 minutes.

All these materials have been subjected to experimental tryouts, and their validity appraised in terms of their ability to distinguish between good and poor groups of shop workers, or of shop trainees, the extent to which they correlate with training school grades, and the extent to which they predict early termination for unsatisfactory work. No attempt will be made here to summarize the findings with respect to any of these tests; however, it may be stated that Selection Tests 6 and 7, up to the present time, seem the most promising of those listed, and that Selection Tests 1 and 5 also appear to have some validity for the purposes described.

In addition to the tests listed above, there is used with applicants for mechanical positions a so-called *Learning Ability Test* which is a 90-item self-administering verbal intelligence test requiring 30 minutes of testing time. It is composed of items adapted from the Kansas revision of Army Alpha, and of items developed by the Testing Unit. This test has now been standardized on thousands of applicants for positions in the Command. Data have been accumulated indicating that the test is functioning well in the prediction of success in mechanical work. Furthermore, arrangements have been made with the War Manpower Commission for use by Air Service Command activities, of tests developed by Occupational Analysis Section of the U.S. Employment Service. The USES tests which have thus far been used include tests of knowledge of proper tools for specified tasks (designated as C-48 by USES), of ability to recognize the order in which pictured parts of familiar objects should be assembled (C-69), of surface development (C-70), and of block counting (C-93). Of these tests the ones which thus far appear most promising are C-70 and C-93.

Although not properly a part of the aptitude test program, it is appropriate to mention at this point that arrangements were also made for use of U. S. Employment Service Oral Trade Questions by Air Service Command activities, since these tests are used in connection with initial placement. However, as mentioned above, the number of experienced personnel applying for positions, for whom such tests would be applicable, has been so small that the use of these tests has been rather limited.

All of the above-mentioned tests are paper-and-pencil tests. A question will naturally arise as to the apparent lack of emphasis on the motor or manipulative aspects of mechanical aptitude. Two depots which were conducting testing programs independently of the Headquarters Unit have used a variety of manipulative and dexterity measures, but the Headquarters staff has devoted very little of its time to such materials. It has been the attitude of the staff that the added information which might be yielded by such measures was not sufficient to compensate for the difficulties in the production, development, and administration of such tests; nor has there been found in the literature or in discussions with other agencies which have worked in this area, evidence to contradict this point of view. An essentially similar point of view prevails with reference to personality tests.

The problem of validation of aptitude test materials such as these is, as is well known, a most difficult one, not particularly because of a lack of suitable techniques, but because so many factors beyond the control of the test technician limit the application of the techniques. If an attempt is made to validate the tests in terms of prediction of training school success, it is characteristically found that the only grades available are based on essay type examinations of questionable reliability. If the validation is in terms of success in the shop, it must ordinarily be in terms of foremen's ratings or rankings of the efficiency of the workers, which are notoriously lacking in both reliability and validity. In either case the size of the groups on which the validation studies must be conducted is usually small, since at any given depot the number of workers performing any particular kind of work, or in any given training course is not large. Since the shop workers are engaged in a repair and maintenance task rather than a production task, there are very few groups for which it is possible to obtain a product criterion. Separation rates may also be used as criteria, but at best these are ambiguous indices of success, since they are influenced by so many factors that are unrelated to the abilities of the workers—for example, housing and transportation conditions, salary, etc. In spite of these recognized imperfections, however, all the above types of criteria have been employed in the validation of Air Service Command tests, since they were the best available criteria at the time. It is anticipated that more adequate criteria in the form of objective-type trade information and performance tests will be available in the future as a result of construction of such tests as described below.

Efforts have also been made to improve the placement of clerical workers through the use of a Clerical Aptitude Test, a Stock Checking Test, and a Supply Record Test, all of which have been developed by the test construction staff, together with the above-mentioned Learning Ability Test.

The *Clerical Aptitude Test* includes 6 separately-timed sub-tests—alphabetizing, file coding, digit counting, number checking, arithmetic computation, and locating information from tabular data. It requires about 30 minutes of working time. A self-administering form of this test, incorporating three of the more valid types of material of the longer form has also been developed and is gradually supplanting the longer form of the test. The *Stock Checking* and *Supply Record* tests measure the ability to perform simple stock inventory and record tasks, and approach the nature of work samples.

Considerable data have been accumulated on the validity of the Clerical Aptitude and Stock Checking tests, both in terms of prediction of grades in training schools for clerical employees, and in terms of correlations with supervisors' rankings or ratings of employees.

It is planned to make more widespread use of a series of tests covering more specific clerical abilities—for example, filing, posting, checking, spelling, language usage, and arithmetic computation, and a test on military correspondence, which involves special forms and rules with which typists and stenographers in Air Service Command stations must be familiar. Use of these specific tests in conjunction with information about the specific abilities required in various classes of positions should make possible improved matching of job and worker.

Trade Information and Performance Test Program. In addition to the development of tests for use in initial placement, one of the earliest assignments of the Testing Unit was the task of constructing trade information and performance tests to assist in the proper placement of civilian personnel in the maintenance shops. These tests were intended to measure the knowledges and skills required for properly discharging the duties and responsibilities of the various classes of positions and thus to afford a more objective basis for promotions, transfers and other personnel transactions than would otherwise be available. Some idea of the magnitude of the task may be gleaned from the facts that there are more than 200 different kinds of work in the shops, and that more than one test would be necessary in many of these areas to provide for different levels of work, even of the same general sort.

To date, test items have been constructed in approximately 60 areas of work, covering the basic information required by the workers in these fields. Some of the areas in which work has been done are listed below:

Aircraft Dissassembler
Aircraft Final Assembler
Aircraft Battery Servicer
Armament Servicer
Bench Worker
Blacksmith
Block Tester
Carburetor Service
Aircraft Crankcase and Crankshaft Servicer
Cylinder and Piston Repairer
Electrical Instrument Servicer

Electrical Equipment Installer
Maintenance and Construction Electrician
Electroplater
Engine Assembler
Engine Disassembler
Engine Installation
Fabric, Canvas and Leather Worker
Magnaflux Operator
Metal Fittings and Small Parts Manufacturer
Flight Test Servicer
Foundryman
Fuselage and Metal Surface Repairer
Generator Servicer
Safety Glass and Plexiglas Worker
Grinder
Gyroscope Servicer
Heat Treater
Hydraulic Equipment Servicer
Hydrostatics Servicer
Landing Gear Installer
Engine Lathe Operator
Machinist
Magneto Servicer
Milling Machine Operator
Navigation Instruments Servicer
Optical Instruments Servicer
Brush, Spray and Stencil Painter
Parachute Rigger
Patternmaker
Pressure Instrument Servicer
Propeller Servicer
Radiator and Cooler Servicer
Sandblaster
Screw Machine Operator
Seamstress
Shaper and Planer Operator
Sheet Metal Manufacturer
Sheet Metal Repair
Spark Plug Servicer
Starter Servicer
Supercharger Servicer
Metal and Rubber Tank Servicer
Watch and Clock Repairer
Welder
Wire and Cable Servicer
Wire Manifold Servicer
Wood Surface Repairer
Woodworker

The materials have included true-false, multiple-choice, matching, completion and picture items, although the majority of the material constructed to date has been of the multiple-choice and true-false type. The material for these tests has been obtained from a variety of sources, including the following:

a. Instruction Manuals, textbooks and other materials used in the training schools in courses preparing for work in the shops.

b. Technical Manuals prepared by the War Department on many phases of the work done in the shops.

c. Technical Orders issued by the Air Service Command governing maintenance and repair of Army Air Forces equipment.

d. Manufacturers' handbooks, covering the maintenance and repair of their products.

e. Observation and analysis of the work in the shops, and discussion with foremen, training school instructors, and workers as to the nature, organization, and difficulty of the work.

f. Consultation with classification analysts who had completed occupational analyses of the work prior to the start of test construction work. The work of the classification staff proved most useful in this connection, since it indicated not only the specific tasks performed by the workers of a given class but also the approximate amount of time spent by the workers on each of these tasks; this served as one index of the relative importance of the different tasks.

The procedure finally adopted in developing a test for a given class of positions was as follows: The test author first became familiar with the content of the field by reference to the sources listed above, and then proceeded to write test items covering what he thought to be the most important phases of the work. All items were then edited from the standpoint of suitability of language, freedom from ambiguities, adequacy for measuring purposes, and technical accuracy. The materials were next submitted to the one or more foremen of the appropriate department in the shops, who went over them, item by item, with the test author. The items were then revised in the light of the foremen's criticisms, and new material prepared to cover areas which the foremen felt were inadequately sampled in the original material, and to replace discarded items. These revised test materials were administered to as many workers as possible in the class in question, and difficulty and validity measures computed for the items. The next step was to prepare a second experimental edition of the test and submit this newly revised form to another group of workers, again determining the validity and difficulty of the material. Ratings or rankings were obtained from the foremen for all the workers tested, which were used as a criterion against which the test was validated. After a sufficient amount of material had been thus tried out so that the items remaining after analysis constituted an adequate sample of the field, the test was considered ready for standardization. Relatively few tests have as yet reached this stage. Standardization presumably will be accomplished by administration of the tests at all the depots. No tests have as yet gone through this final step of standardization.

The above brief summary of the test construction procedure scarcely suggests the innumerable difficulties and obstacles which arose at almost every step. It is not pretended that anything like adequate solutions have been found for many of these difficulties. Some of these difficulties are mentioned here so that others involved in similar programs may be aware of the troubles which are likely to beset them.

In the first place, it was probably to be expected that trade information items produced by test writers having little or no experience in mechanical work, however thoroughly these writers attempted to familiarize themselves with the work, would have a high mortality; and such indeed proved to be the fact. The percentage of items which had to be revised or discarded in the light of the foremen's criticism and subsequent tryout often approached, and sometimes exceeded 50. It has become thoroughly clear that the price of valid and insightful item construction is extended and painstaking analysis and observation of the work, and thorough discussion with those who know the work.

Secondly, there has been the ever-present problem, mentioned in connection with the aptitude tests, of obtaining satisfactory criteria against which to validate the tests. The test construction group has at times found itself in the anomalous position of accepting as criteria foremen's estimates of subordinates' work, although the test was intended to supplant the subjectivity of these very estimates—a situation reminiscent of the efforts of early intelligence testers to validate their instruments against teachers' estimates of brightness. The foremen's ratings may be in error for a variety of reasons, some of them common to rating scales in general and others of them specific to the shop situation, but generally speaking, they were the best estimates available of the abilities of the workers. Some of the difficulties inherent in the use of foremen's estimates as criteria can be minimized by supplementing sheer rankings, or formalized ratings, by rather thorough discussion with the foreman who rates the workers, of his reasons for rating them as he does. The rankings or ratings, and their correlations with the test scores, can then be interpreted in the light of this supplemental information. This procedure, however, is somewhat subjective, and cumbersome where sizable numbers of cases are involved. As a matter of fact, it is quite possible that the tests themselves in some instances furnish more valid estimates of the abilities of the workers than do the foremen's rankings, assuming that the tests have been reasonably well conceived and executed. It has been interesting to observe how readily some of the foremen accepted the test rankings as more accurate than their own judgment of the men's abilities and it is noteworthy, too, that foremen in general welcomed some objective means by which they can be guided in the evaluation of their subordinates. Foremen sometimes do not have sufficient opportunity to observe the men under them to permit an accurate evaluation of their merits, and they appreciate some means whereby they can quickly and accurately appraise the new workers who are continually being assigned to them.

In the third place, it has been necessary to do most of the work of validating with samples which, when judged in the light of the numbers of cases ordinarily used in development of standard tests, are ridiculously small. Unfortunately for testing purposes, the number of milling machine operators, or landing gear installers, or parachute riggers at any given depot is rather small, and the magnitude of the sampling errors involved in most of the test construction work of the Unit is at first a little disturbing to one accustomed to working with hundreds or thousands of cases, as is true with most educational tests. The size of the sample is, however, an element beyond the control of the test constructor and simply places on him the burden of using with the utmost care those small numbers of cases which are available. This difficulty will be overcome to some extent by accumulation of data over a long period of time, and by collecting data from several or all depots.

Another source of difficulty has been the rapidly changing character of the content with which the tests deal. Airplane engines, parts, and accessories are in constant process of improvement, and it is all but impossible, in some cases, for the test constructor to keep his material abreast of changing conditions in the shops. To mention one instance, one member of the staff spent considerable time developing test materials for carburetor servicers, only to discover that the type of carburetors on which he had been preparing items had become obsolete almost while he wrote. Fortunately, this is an extreme illustration, but the content in virtually every field is subject, to greater or less degree, to continual change.

The last difficulty which we shall mention is a practical one, arising from the difficulties attendant upon interrupting the vital work of the ground crew personnel of the Army Air Forces. For obvious reasons, the amount of time which foremen and workers can be asked to take from the performance of their duties to cooperate in test development research must be kept at a minimum, and this circumstance has conditioned the speed and thoroughness with which it has been possible to advance the work. It should be stated that in general the foremen and the workers have been found most willing to cooperate in the development of the test material when the purpose and significance of this work was properly presented to them. Many of the foremen have gone over the test materials on their own time and have been most helpful in arranging their work so as to facilitate the administration of tests.

The construction of these trade information tests has been carried on chiefly by Dr. Brent Baxter, Dr. William Biel, Dr. Ruth Cruikshank (prior to her enlistment in the WAVES), Dr. Walter Durost, Dr. James Karslake, Mr. Edward Sait, and Miss Evelyn Potechin.

Although the essential role which performance tests must play in the proper placement of shop personnel has been recognized, the staff has devoted much less of its time to the production of performance tests than of paper-and-pencil tests, with the result that progress on the development of the performance tests has been rather slow. To date, in fact, performance materials are available in only about a half-dozen fields. In general, development of these materials has followed the same pattern as the development of the paper-and-pencil materials. It has involved the added task of planning and arranging for the production of the materials themselves in the shops, difficult because of the undesirability of interrupting the regular work of the shops. The development of these performance tests has been largely the responsibility of Mr. Claude Bridges, Dr. Walter Durost, Mr. Richard John, Dr. J. Karslake, Mr. David Ekberg, Mr. C. Quick, and Dr. A. S. Switzer (prior to Dr. Switzer's commissioning in the Army Air Forces).

The development of these upgrading tests, both information and performance, has been virtually at a standstill during the past year, partly because the staff has had to devote its time to the more urgent problems of initial placement, but even more because the labor situation in the shops was one of excess of demand for skilled workers over available supply, so that many operating officials felt that the standards for upgrading to higher-level positions could not be maintained as high as would normally be desirable. At the time of writing, however, it appears likely that there will be a renewal of activity in the upgrade testing program. As a result of decreased turnover, of extensive training programs and of general stabilization of the labor situation, the time is approaching when the supply of skilled labor will equal or exceed the demand, and it will again be desirable to specify the possession of certain knowledges and skills as prerequisites for promotion.

Typical Uses of Aptitude Tests at Air Service Command Stations. To understand the role which the Air Service Command tests play in placement, it is necessary first to recognize that Air Service Command is a Federal agency, and consequently all recruiting and selection of civilian employees is the responsibility of the Civil Service Commission. Thus all prehiring testing is the function of the Civil Service Commission, and the agency may use its tests only for proper placement of individuals who have already been hired. An exception to this general rule exists in case of mechanic learners and general mechanic helpers, which are the two lowest designations of aircraft maintenance workers. In the case of these two classes the Commission had recognized the right of Air Service Command to reject, on the basis of its tests, applicants who otherwise meet Civil Service requirements. Since individuals are certified by the Commission and hired at specific levels, the possible utilization of the test results is reduced to placement within one or another position within the specified level; however, there is a sufficient variety among the positions at a given level so that the test results can be used effectively in improving placement. In the case of mechanic learners and general mechanic helpers there is a tremendous variety of level and kinds of work or training courses to which they may be assigned and for this group the use of some tests for placement purposes becomes almost indispensable.

There is a sufficient variation in the organization and functioning of testing programs at the several depots to make it difficult to describe any "typical" program, but certain aspects are more or less common to all. The incoming applicants may be grouped roughly into those with experience relevant to the requirements of some position which is open, and those without such experience. Placement of the former group may ordinarily be made fairly readily on the basis of their experience, with tests serving only to verify the applicants' claims of qualifying experience. Placement of inexperienced applicants, however, is a more difficult task. The practice has generally been to assign all inexperienced shop workers to training school prior to assignment to the shops; thus it was desirable both to identify those who would be unlikely to profit appreciably from any formal training, and to determine the kinds of training courses (and eventually of work) for which each applicant was best suited. Tests are typically given to the applicants prior to assignment to a course, sometimes in connection with a preliminary orientation program. The training school courses, or classes of positions in the shops, to which assignments may be made are grouped into four or five levels of difficulty, ranging from very simple work such as spark plug servicing, or washing and cleaning of parts, to the most difficult kinds of work, such as instrument repair or certain armament repair. Then, on the basis of the test results, the applicants are likewise grouped into several ability levels and recommendations are made such that the most capable applicants are assigned to the most difficult types of work. Naturally, it is not always possible to effect an ideal matching of job and worker because of the limitations imposed by the numbers of positions open at the various levels; but it is possible to avoid in this way gross misplacements that would almost surely lead to failure on the job or waste of time. The estimation of the difficulty of the various kinds of work or of the training school courses is made possible by careful consideration of the information obtained by the classification analysts, discussions with foremen and shop superintendents, and consultation with training school instructors.

No attempt has been made to develop tests so specific that they will predict success in very narrow fields, such as propellor repair, parachute rigging, bombsight servicing, etc. While it is possible that the abilities required for success in each and every kind of work could be differentiated, this is not a task that could be accomplished in the limited time that was available.

A similar system has been developed for the placement of clerical workers; the various classes of clerical positions have been ranked in terms of difficulty and employees are assigned to work of given difficulty in accordance with abilities as revealed by the test.

Use of test results by supervisors. It has always been one of the aims of the Testing Unit that the use of test results should not stop with initial placement but should continue as a factor in all subsequent decisions affecting the reassignment or reclassification of the individual. To this end provision has been made for having the test results, in the form of percentile ranks, follow the worker into the unit to which he is first assigned so that the supervisor may have the advantage of this information in his dealing with the employee. Such a program naturally is ineffective unless the supervisors are trained in the use of the test results. To provide such training, literature has been prepared for distribution to supervisors describing the significance of the test results and indicating to them how they may be used in improving the placement of their workers. An outline has also been prepared of a brief course in the use of test results, to be given to supervisors as part of the War Manpower Commission supervisor-training courses now being conducted at almost all the depots. A similar program is contemplated for those employee relation counsellors who do not already have sufficient background in the use of tests.

Handbook on the Use of Tests. A "Handbook on the Use of Tests in the Placement of Clerical Personnel" has been prepared which sets forth in simple, non-technical language the purposes which tests may serve, and the way in which they may be used in improving placement. This Handbook was designed to assist the personnel officers in stations too small to warrant the employment of a trained testing technician, as well as for the benefit of all personnel who might have occasion to use test results, but who did not have psychological training or experience in the field. At the time of writing, some 1200 copies of this Handbook have been distributed.

Other activities. The services of the testing units at the various depots have been enlisted in connection with a variety of problems in addition to their regular duties. Testing of the personnel in branches or sections where special placement problems exist has sometimes been requested by the officer or supervisor in charge; testing of military personnel attached to the depots or nearby stations has been undertaken when requested; individual testing has been done in connection with transfers or reassignments. Assistance has been afforded to training instructors in the construction of examinations for their courses.

A recurring problem has been that of interpreting and selling to supervisors and others, untrained and inexperienced in this field, the uses and possibilities of psychological tests, and of convincing operating officials of the advantages of making more extensive use of test results in personnel transactions. This problem has been complicated by the difficulty of obtaining the kind of evidence most likely to impress these people—dollars-and-cents indications of the savings, in terms of reduced turnover, or decreased training time, or more efficient workers, made possible by proper use of tests. In general, however, almost all officials have been found sympathetic to the concept that psychology can make a genuine contribution to the solution of some of their personnel problems, and it is believed that the work herein described has tended to confirm their belief in this concept.

THE PERSONNEL CONSULTANT IN AN ARMY TRAINING CENTER*

G. M. GILBERT, 1st. LT., AGD
Personnel Consultant

Previous articles in the *Psychological Bulletin* have described how the Personnel Research Section, Classification and Replacement Branch, The Adjutant General's Office, has contributed to setting up the Army's classification system and personnel procedures. The present paper is intended to describe from first-hand experience how one psychologist, like many others, has functioned in one important aspect of personnel administration in the field: acting as Personnel Consultant in an army training center.

During the training period, all men must be classified and trained in the military duties for which they are best fitted; civilian skills and temperaments must be adjusted to war-time needs; misfits must be eliminated; and numerous other problems of a more or less psychological nature must be met as they arise. There are no two training centers in which the duties of the Personnel Consultant are precisely the same, since these are dependent on the problems and requirements of the command to which he is assigned as well as his own qualifications and adaptability. However, the following directive, issued at headquarters where the writer was assigned, will serve as an example of the duties assumed by a Personnel Consultant in a training center of the Army Ground Forces:

OFFICE OF THE PERSONNEL CONSULTANT

The Office of the Personnel Consultant operates as a liaison unit of the Classification Office, Hq AAATC, to facilitate consultation and action on personnel problems, reclassification, and testing . . . . The following matters are referred to the Personnel Consultant:

1. *All possible Sec. VIII cases* (*AR 615–360*): Cases of suspected or demonstrated inaptitude, undesirable habits or traits of character, or lack of adaptability will be examined by the Personnel Consultant, and appropriate recommendations made. Where Sec. VIII is recommended, the report will constitute expert testimony and Proceedings of Board of Officers will be submitted to Hq AAATC within 7 days after date of Personnel Consultant's report (see Administrative Memorandum Number 14 . . . .)

2. *AWOL and other offenders:* In order to reduce the repetition of AWOL and other Court-Martial offenses by proper guidance, as well as to eliminate chronic offenders and trouble-makers who do not possess the required degree of adaptability to military service, the following measures will be taken:

a. AAATC prisoners in the Camp Stockades will be interviewed periodically to determine fitness for service and future rehabilitation possibilities. Where Sec. VIII proceedings or psychiatric examination is recommended, appropriate action will be taken.

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* The views expressed herein are those of the author and are not necessarily accepted officially by the War Department.

b. A follow-up of prisoners upon completion of sentence will be maintained by the Personnel Consultant for rehabilitation purposes. Wherever desirable, such men will be transferred to other units or otherwise reassigned and counselled in order to effect rehabilitation.

c. All second offenders, if not in the Stockades, should be referred to the Personnel Consultant by the Battery Commander for interview.

3. *Voluntary Consultation for EM:* Enlisted men may be referred to the Personnel Consultant by their Battery Commanders on any personal matters not of a religious or financial nature, particularly matters affecting their adjustment to the army and maximum usefulness to the service . . . . The facilities of the Classification Office will be used to make any advisable reassignments, transfers, selection for specialist training, etc. Information and guidance will be given with a view to promoting efficiency and morale. No formal referral required.

4. *Illiterate and Non-English:* If assigned to AAATC after July 15, 1943, they will be returned to Reception Center. A class is now being conducted in the Enlisted Cadre Pool under the supervision of the Personnel Consultant for the remaining illiterates assigned before that date. Admission to this class will be made only with the approval of the Personnel Consultant.

5. *Classification tests and retests:* Tests or retests on the AGCT, 2abc, Mechanical Aptitude, etc. should be arranged as far as possible in groups by appointment with the Personnel Consultant's Office or Classification Office. Individuals will be tested on Saturday mornings. A letter giving previous date, score, and type or form of test will be sent in advance in all cases.

6. *Maladjusted Individuals:* Cases of apparent shirking of duty, queer behavior, constant discipline, chronic alcoholism, and other evidences of maladjustment may be referred for consultation and guidance. Wherever possible, attempts will be made to determine the cause and institute corrective measures, or effect other appropriate disposition.

7. *Lectures on Classification, Personnel Problems, and Military Psychology* may be arranged for officer's schools, cadre schools, or orientation courses for non-coms or enlisted men.

By command of Brigadier General——

Although adaptability to military needs rather than academic accomplishment is the chief criterion of a psychologist's value to the service, his duties presuppose competence in at least two academic fields of psychology: (a) clinical (including testing and guidance) and (b) educational. A brief discussion will serve to describe the application of clinical and educational psychology to military needs.

CLINICAL

One of the important clinical tasks of both psychiatrist and psychologist in an Army training center is the elimination of those mentally unfit for military service. Army Regulations provide two means of discharge for such cases: Certificate of Disability for Discharge (CDD), effected upon recommendation of a Board of Medical officers, and the "Sec. VIII" referred to in paragraph 1 of the above directive. Cases of psychosis, psychoneurosis, and other nervous disorders are disposed of by CDD. Under Sec. VIII, a large variety of other misfits are dis-greatest single problem, with others ranging all the way from simple misassignment to serious mental deviation. The educational functions include advising on setting up classes for illiterates and on selecting men for specialist training, as well as lecturing officers on personnel psychology. Although academic competence is presupposed, adaptability to military requirements is the primary qualification for the psychologist in the field.

THE WORK OF PSYCHOLOGISTS IN THE NINTH SERVICE COMMAND SPECIAL TRAINING CENTER*

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AND
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The Special Training Center for teaching illiterates in the Ninth Service Command, which includes the states of Washington, Oregon, California, Idaho, Montana, Utah, Nevada and Arizona, is located at Camp McQuaide, California. Trainees are shipped to this center from the Reception Centers at Fort Lewis, Washington, Presidio of Monterey, California, Fort MacArthur, California, and Fort Douglas, Utah, and are given instruction in academic and military subjects.

The function of a Special Training Unit is the instruction of enlisted men who are not immediately suited to assimilate successfully the regular basic program of training or who during their regular course of instruction indicate that they require special attention. This unit is responsible for teaching illiterates, non-English speaking, and slow learning men.

The specific objectives of this Special Training Center are as follows:

1. To prepare trainees to absorb basic military training at a Replacement Training Center, Unit Training Center or a separate unit.
2. To insure that all men assigned to units are able to read at a fourth grade level.
3. To insure that all trainees are able to understand and to speak simple English.
4. To enable the trainees to do simple problems in arithmetic.
5. To give the trainee sufficient basic military training so that when he is assigned to regular training, he will be able to complete it with a minimum of special assistance.

SELECTION AND TRAINING PROGRAM

Men received at Reception Centers from induction stations in the Ninth Service Command are given the Army General Classification Test and those classified as Group V are reviewed by the classification officers and all non-English speaking men, illiterates, and slow learners, are shipped to Camp McQuaide. The men are tested and then assigned to classes on the basis of their scores. They are grouped in classes according to their abilities and instruction is given in reading, arithmetic and expression. Except in unusual cases the maximum amount of time that a man can remain in the Training Center is twelve weeks, but the course is planned with the idea that the majority of the men will complete it in eight weeks. Men who complete their training program successfully are graduated and shipped to a Reception Center for assignment. Those who are unable to complete the training in the maximum time are discharged. A recommendation for discharge is instigated only after every effort has been made to rehabilitate the man.

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* The opinions and assertions contained in this paper are those of the authors and are not to be construed as official or as reflecting the views of the Army.

WORK OF THE PSYCHOLOGIST

Personnel. Four Personnel Consultants, all of whom have had training and experience in clinical psychology, have been assigned as officers in the Special Training Center. The officers are assisted by eight enlisted men who have had training and experience in testing, interviewing, and the interpretation of statistical data. The Personnel Consultants have been given five types of duties: (1) the testing program, (2) interviewing, (3) personnel records, (4) improving the instructional program, and (5) the collection of statistical data.

Group Testing. The initial responsibility of the Personnel Consultants is to determine the capacity of the men assigned for training so that they may be placed in academic classes according to their abilities. This is accomplished by administering two group tests. The first of these consists of three parts,—word meaning, paragraph meaning, and arithmetic, and requires a fair degree of reading skill. The second is made up of illustrated material and requires very little reading ability. On the basis of the scores on these tests the men are assigned to Groups I, II, III, or IV in academic classes. The men are also given a military vocabulary test consisting of 102 terms used frequently in basic military training. This test is given again at the completion of training to determine how many words have been learned. A diagnostic arithmetic test, which includes many combinations of simple addition, subtraction, multiplication, and division, is also given at the beginning and at the completion of training.

Promotion from one level to the next is determined by means of four group tests containing material similar to that included in the test used for initial placement. Graduation from the Training Center takes place when a man has passed the final tests for Group IV (literacy and arithmetic), has been given the Army General Classification Test, and has demonstrated military attainments which justify forwarding him from such a unit. He is then shipped to one of the Reception Centers for assignment. All the group tests used in this program are issued by the Adjutant General's Office with the exception of the diagnostic arithmetic test and the military vocabulary test.

Individual Testing. In addition to the group tests every trainee is given a number of individual tests. These tests require approximately one hour for each man and are given in small interviewing rooms. Most of the examiners speak more than one language which enables them to work more effectively with the non-English speaking men. The trainees spend approximately ten minutes with each of the six examiners. Each examiner is trained to give the whole battery of tests so that it is possible to rotate the tests to avoid the monotony of giving the same test over and over again. The examiner records his findings upon a permanent record card which the interviewee carries from one interviewer to the next.

The individual tests administered to the men include the vocabulary test of the Stanford-Binet Intelligence Examination; the Wechsler Mental Ability Scale B; the Gray Oral Reading Test; a reduced form of the Bell Adjustment Inventory, and an Army Adjustment Inventory. At this station a general information test developed by the authors and measures of paranoia and hypochondria, developed by the second author of this paper, also have been used. All the verbal tests are given orally. Spanish translations have been made of most of the tests and are used with many of the non-English speaking men. Additional individual tests are in the process of development at the present time.

Interviewing. The initial interview of a trainee occurs at the same time that he is given the individual mental examination and is an integral part of it. At this interview facts concerning the man's place of birth, occupation, education, income, nationality, criminal record, literacy status, marital status, and family data are obtained. This interview takes place at the head of the line of examiners and requires approximately ten minutes per man. A second type of interview occurs when a man is referred to the Personnel Consultants by the company commanders in connection with a possible discharge for inaptitude. At this time the man's academic and military record is reviewed and a recommendation made to the officer referring the trainee. Classroom instructors frequently refer men to the Personnel Consultants who evidence some personal or social maladjustment in the classroom. Following the interview an oral and a written report are made to the teacher. Requests for interviews of trainees come also from the post surgeon,who is a psychiatrist, and from the other medical officers; these interviews are followed by joint consultations with the referring officers.

Reporting Personnel Data. The results of the interviews and testing are recorded on a cumulative record card and then made available to the various sections of the Special Training Center. Every instructor in the school is given a statistical and graphical report on each man in his class. This report is a condensation of the data on the man's cumulative record card. The traits included in the report are general learning ability, skill in oral reading, skill in addition, subtraction, multiplication and division, arithmetic reasoning, emotional stability and morale.

The teacher's attention is called to cases of word-blindness, error patterns in arithmetic, and to cases of emotional instability. The literacy status of foreign speaking individuals is also indicated. These reports are taken personally to the instructors by one of the Personnel Consultants who goes over each trainee's record and calls the attention of the instructor to personal data about the man that may be useful to him in his instruction.

A report of the psychometric examination is also sent to each company commander in the Special Training Center and is essentially a duplicate of the one received by the academic instructor. The difference lies in the fact that the one sent to the officer sometimes includes a statement that a given man is a potential discharge case or that another man is considerably above the average in ability and might be graduated at an early date. Company commanders are also furnished oral reports on men who are potential discharge cases or who are being considered for early graduation.

Each company commander is furnished a report of the scores on all group tests for the men in his company. This includes the initial placement tests, the tests used for promotion from one group to the next, and the final graduation examinations.

The Personnel Consultants also prepare a certificate on each man who is recommended by the company commanders for discharge for inaptitude. The certificate includes a statement of the date of the man's first assignment to the Special Training Center, his age, marital status, education, occupation, scores on all individual and group tests, a history of his academic progress in the Special Training Center, and a recommendation as to whether the man should be discharged from the Army or retained for further training. No man is discharged until his psychometric history has been thoroughly analyzed. In many instances, a man is interviewed a second or a third time in order to make certain whether it is possible for the Army to use him.

Improving Instruction. Another responsibility of the Personnel Consultants is the improvement of academic instruction. This is accomplished in part by providing the teachers with information on each man in his class, and by conferences between the teachers and the Personnel Consultant who acts as a liaison officer between the training and the testing sections. Academic instruction is also facilitated by means of evening classes in teacher-training. Such a program has just been completed which extended over a period of six weeks. The classes were held twice a week for approximately two hours for each meeting. The topics covered in the course included: *The place of the special training unit in the Army, the work of the teacher in the Special Training Unit, the psychology of learning, the psychology of arithmetic, reading and spelling, the techniques of teaching reading, the techniques of teaching arithmetic, the* *methods of teaching spelling, the use of standardized and classroom tests in the improvement of instruction, mental health factors in the classroom,* and *the evaluation of instruction in the special training classes.* The speakers included instructional specialists from the Los Angeles City Schools, the University of California at Los Angeles, and Claremont Colleges; the Commanding Officer, the Battalion Commander, and the Director of Training of the Special Training Center; and members of the Personnel Consultants Section. The meetings consisted of lectures, demonstrations, discussions, and a final examination. The classes will be resumed in the near future at which time committees will be organized to develop supplementary instructional materials adapted to the different ability levels of the men in the Training Center.

Statistical Studies. From time to time the Personnel Consultants carry out statistical studies of the men in the Special Training Center. Requests for such studies are received from the Adjutant General's Department in Washington, D. C., from the Headquarters of Ninth Service Command, Fort Douglas, Utah, and from the Battalion Commander of the Special Training Center. Studies of the reliability and validity of the tests now being used are carried on at intervals, and new norms set up. New tests are being developed for individual testing and will be introduced when their statistical validity has been demonstrated.

BOOK REVIEWS

Polyak, S. L. The retina. The anatomy and the histology of the retina in man, ape, and monkey, including the consideration of visual functions, the history of physiological optics, and the histological laboratory technique. Chicago: Univ. Chicago Press, 1941. Pp. x +608, with 100 plates.

The somewhat lengthy sub-title quoted above gives a vignette of this compendious volume. So broad a consideration ought to attract a very wide circle of readers unless the layman interested in the growth of our knowledge about the eye is dismayed by the minutia of detail, or the specialist is made impatient by the inclusion of so much elementary material. A completely comprehensive treatise, as this attempts to be, runs such dangers. On the other hand, a novice who aspires to specialization in the field could do worse than assimilate its contents.

Chapter I gives a brief description of the vertebrate visual mechanism which the reviewer would recommend for assignment to students in elementary psychology and to others beginning the study of vision, since it is always most satisfying to have such a background from the pen of a physiologist. Part I (Chapters II to VI) covers in detail the methods of investigating the histological structure of the nervous system, and for present purposes, we can pass on to Part II which, though it contributes no new data, brings together a history of the study of the eye. Aside from being interesting, it gives emphasis to an aspect of knowledge that is being more and more disregarded in the sciences, particularly in psychology. While George Sarton and others have done much to dispel the "darkness" of the Middle Ages, there is still too great a tendency to disregard our intellectual forebears—even very recent ones—and look upon current techniques and hypotheses as if they were historically unique and autonomous. To accompany the historical discussion figures 5 to 35 show at a glance how knowledge of the eye has grown from Ḥunain Ibn Isḥāḳ A.D. 860 to Raymon y Cajal A.D. 1923. It is interesting to note that many current textbooks carry diagrams of the retina identical with, or very similar to, the conceptions of Kolliker, 1854, M. Schultze, 1870, and Schwalbe, 1874, (Figs. 27, 28).

Part III takes up an historical account of the study of the retina as distinct from that of the eye as a whole. Since such work implies microscopic examination, there is little of importance to record before the time of Leeuwenhoek (1632 to 1723) although the macroscopic observations of the Greeks had given the retina its name. More recent work is evaluated in some detail in order to further the author's thesis that the structure of the retina has not been sufficiently studied. No one, I think, will take exception to that. The section ends with a statement of eight fundamental criticisms of current theory of visual function, of which the one just mentioned is basic and some of which are of particular interest to psychologists. The author raises pertinent objections to certain aspects of the "Duplicity Theory," which imply two distinct retinal processes for "bright white" of photopic vision and "dim white" of scotopic vision, and holds that complete histological separation of the rod system from the cone system is doubtful. Likewise he points out that the known structures are insufficient to explain visual acuity.

The author is now ready to undertake in Part IV his major problem, a study of the "Minute Structure of the Retina," in which he follows his historical mode of presentation. Sixty some plates of original microphotographs, freehand drawings and schematic diagrams with descriptive legends constitute his presentation of data, and make a notable contribution. In interpreting the plates in the text, he places new emphasis upon morphological characteristics of the several neural elements, on the hypothesis that a relationship may be found between structure and function. This, after all, is but an extension of the differentiation between rods and cones to include such things as the termination of the rods in smooth, oval buttons, much different in size and shape from those of the cones which he describes as "quadrangular buds with rounded edges" "a kidney or a pear," "club like or hoofshaped," "more or less conical" according to the region of the retina in which they occur. He gives similar attention to the morphology of the "horizontal or outer associational cells," of the amacrine cells, of the ganglion cells, and of the centrifugal fibers. The way in which he utilizes the morphological data can be illustrated best by quoting directly from his discussion.

> That the spreading of a nervous "impulse" is a process requiring a measurable time is well assured from numerous experiences in neurophysiology. This, in turn, implies certain differences in the dynamical status of the diverse parts of a neuron: its cytoplasmic cone, its cortical zone, its surface film, its protoplasmic expansions, its axis cylinder, and its teledendron. For it is impossible to imagine an absolutely homogeneous dynamical condition in all these diverse and often distant parts, arising simultaneously and disappearing like an "explosion." Furthermore, purely structural factors—difference in the shape, size, numbers, arrangement and so forth of the parts of a neuron serving as the synaptical contact surfaces—may be invoked in support of this view (376).
>
> The impressive fact here is the regularity in the arrangement of the synaptical contacts. A neuron of a given variety—for example a mop bipolar or a midget bipolar—is found to possess synaptical organelles of well-defined form, size, location, numbers and so forth, and always arranged in a certain way. The uniform mode of attachment of each variety of these synaptical organelles to certain definite parts of the related neurons—for example the cone pedicles—is striking . . . . The delicate dendritic filaments—for example, of the mop bipolars—are always found adhering to the lateral sides of the cone pedicles and never to their vitreal faces, which, in turn, are reserved exclusively for the contact with the "bouquets" of the midget bipolars, as well as for some other neurons. The conclusion which may legitimately be drawn therefrom is that the lateral face of the cone pedicle has different dynamical potentialities than its vitreal face. This, in turn, suggests that the influences which pass from an apparently common source of impulses, the cone, over to the mop and midget bipolars are not of the same kind but are in some way different from one another (377).

All such considerations are neatly summarized in four schematic diagrams of the nerve elements of the retina and their interconnections. (Figs. 95–98)

Upon this mass of histological data, for whose verifications and acceptance we must look to the specialists in that field, Polyak bases several tentative hypotheses of psychological import. It is unfortunate that he has not brought to those interpretations a similar intimate acquaintance with the psychology of color vision as he has with histology. Perhaps it is too much to expect, but nevertheless its absence precludes satisfactory hypothetization. The assumptions which he lays down at the beginning have their origin in the physics of light and in casual popular psychology, which have as little bearing on the psychological problem as pre Golgi conceptions have on the histological. They are:

The act [sic] of vision is understood to consist of several distinct processes. These processes are: (1) perception of light per se, or the perception of various light intensities, without distinction of the chromatic hues ("light sense"); (2) Perception of color, or the specific reaction of the visual apparatus to different wave lengths of the visible light ("color sense"); (3) Visual space perception, or the appreciation of the position in space of the sources of light stimuli (this comprises every aspect of the dimensional visual functions variously termed as "space sense," "form sense," "localization," "visual acuity," "directional vision," "vision of movement" etc.); (4) integrating visual functions, including phenomena commonly called "higher" or "psychic" visual functions (398).

These set the course of subsequent speculation. The details are too many to be dealt with here, but while no brief sampling can be adequate to the discussion, some of the more striking conclusions may be pointed out. Polyak gives up the notion of different kinds of cones or of photochemical substances in favor of "Chromatic analysis" by the several types of bipolar cells and integration by the midget ganglion cells. He leans strongly to a three component hypothesis with its consequent emphasis upon color mixture to the exclusion of other equally important psychological facts. Color blindness is the only additional phenomenon considered and it is referred, obviously, to some impairment of the bipolar structures.

Finally, a basis for "the visual perception of [two dimensional] space" is sought in the structure of the retina. Polyak departs from Helmholtz's (431) "dictum that 'two bright points cannot be distinguished as separate unless the distance between their images is greater than the diameter of a retinal element" to the extent that "if true, [it] does not seem to be due so much, if at all, to nearness of the photoreceptor elements to one another as to the incomplete separation of their conductor units in the visual pathway." As a basis for the "innate character of the visual space sense" (444, Fig. 100) the author presents evidence for a precise central projection of the binocular cyclopic field of vision. Spatial relationships are retained but cortical representation of the foveal and parafoveal regions is considerably expanded. Just how this central projection solves the problem is not indicated for one can scarcely take seriously the figurative animism suggested.

The treatise concludes with a chapter of statistical data and measurements of the retinal structures, an extensive bibliography of 129 pages and an adequate index.

Although there is no probability that the present volume will ever achieve popularity, one must regret that it has not been more carefully edited by someone for whom English is the mother tongue. There is no evidence that this is a translation, yet choice of words, use of adverbial modifiers, and form of sentence structure are not those of English prose. Many sentences require rereading and even then may not yield clear cut significance. The reviewer is still not sure of the significance of "inner" and "outer" with reference to retinal structures. Finally, the organization of the material gives an impression of much repetition and that conclusion is borne out by the many cross references. This may be partly necessitated by the method of historical treatment but it could have been minimized by more careful organization.

FORREST LEE DIMMICK

Hobart College.

LANDIS, C. and BOLLES M. Personality and sexuality of the physically handicapped women. New York: Paul B. Hoeber, 1942. Pp. xii+171.

In a previously published study by Landis and others (reviewed in Vol. 38, p. 292–295 of the *Psychological Bulletin*), 153 normal and 142 mentally abnormal women were interviewed concerning their sex information, experience, and attitudes. Three judges evaluated the personality and sexual adjustment of each woman on a series of scales developed for the purpose. Each subject was given an unusually complete physical examination, including x-rays of the pelvic region No physical differences were found between the normal and abnormal groups, but within the normal groups certain physical measurements of the genitalia and general body form appeared to be related to emotional immaturity and to deviant sexual behavior in adulthood.

The present investigation is a sequel to the earlier study. One hundred physically handicapped women—25 epileptics, 25 cardiacs, 25 spastics, and 25 orthopedic cases—were given the same controlled interview used in the previous study, filled out information blanks regarding background and medical history, and took the Rorschach Ink-Blot Test (the results of the latter are not reported). No physical examinations were given the handicapped women. The subjects were between 17 and 30 years of age, some were married, and all had been handicapped from the age of 13 or earlier. The data obtained from the reports of these women were quantified by the assignment of weights on "evaluation" scales as before, the pooled judgments of three raters determining the weights. Not only were comparisons made with the normal group of the previous investigation, but each handicapped group was compared with the others.

The purposes of the study, as stated by the authors, were:

> to determine (1) the common patterns of psychosexual development and personality adjustment; (2) the psychological differences within the handicapped group that might be associated with such factors as type of home background, age at onset of handicap, and nature of handicap; and (3) the differences between the psychosexual development of the physically handicapped group and the physically normal group from the previous study.

Neither the normal group nor the handicapped group could be considered representative of the general population. The first was obtained from women's organizations on a volunteer basis (in itself a selective factor), and the second from medical clinics which drew mainly lower-middle class patients. Obviously no normative data were available for tracing common patterns of development if by "common" the authors mean typical patterns. Though some information was obtained from comparisons between subgroups with different handicaps, the numbers were too small for adequate statistical treatment. Lack of control of the degree of handicap and the length of hospitalization or institutionalization (14 of the epileptics, for example, were institutional cases at the time of the study) further limits the value of the comparisons made. Information regarding the family background of the subjects was obtained only from the subjects themselves, making the validity of this part of the study questionable.

However, such differences as did appear between the various groups, regardless of the objective accuracy of the facts reported, are in themselves of scientific interest. In view of our almost complete ignorance of the psychosexual development of the physically handicapped woman, and keeping in mind the difficulties of obtaining subjects meeting even the more obvious requirements of age and diagnosis, this study is a valuable pioneer effort. The interviewing seems to have been very carefully done, the evaluation scales well worked out, and the tables of comparisons have been published in full so that all interpretations may be checked by the reader. An investigation such as this in which case history material has been meticulously handled and conclusions have been cautiously drawn, points the way to more frequent use of such data for scientific study, particularly in areas where more objective means are rarely available.

To me the most interesting interpretation concerns the lack of evidence of conflict, undue repression, or over-compensation in the handicapped group. Rather than the frustration which might be expected to result from restricted opportunities for social contacts and normal sex life, there appears to be incomplete development of the sex drive, both with regard to its intensity and to the specificity of its expression. On the basis of Freudian principles, one would anticipate distortion of the total personality; however, there appears to be a simpler explanation of the remarkably good adjustment of most of the handicapped subjects. Lack of social stimulation on the one hand and the overprotection accorded handicapped individuals on the other, seems to have resulted in general emotional immaturity with hyposexuality as a part of the total personality pattern.

KATHARINE M. MAURER.

University of Minnesota.

SACHS, HANNS. The creative unconscious—Studies in the psychoanalysis of art. Cambridge, Mass.: Sci.-Art Publishers, 1942. Pp. 240.

A beacon ray for approaching Sachs' treatment of these difficult problems in the field of aesthetics is his simple analogy "that the infantile fantasy-life . . . exercises the same influence on the search for truth as it does on the artist's quest for beauty" (7). Thus we may look to unconscious sources for the basic drives and motive power in creativeness, and also for something of the raw materials or content which are to be worked upon and fashioned into artistic form. The scientist's ambition and interests will be related to his developmental problems, (compulsions, voyeurism, paranoid and narcissistic trends, etc.), as well as his general reactive patterns; these factors will set the initial methodological approaches and select the very areas and problems for study. Yet his finished scientific offering must meet with the laws of logic and scientific method. So, also, the truly perfect work of art has its own criteria for good form or beauty of structure, its own "formal laws," which are universal, in contrast to the more variable psychodynamics in the earlier stages of the creative process. These laws of beauty are Superego standards which, like the formal laws of logic, are considered to have a certain more direct relationship to the structure of objective reality, although the comprehension of these "higher" laws of nature may come through variable developmental routes.

The analogy becomes top-heavy, and Sachs does not overburden it. He grants that very little can be said now of the formal laws of beauty, their nature or their precise relationship to "emotional reality" (one of Sachs' ambiguous concepts). The reviewer has found Gestaltists much more helpful in at least the description of some of the less complex aesthetic problems of formal structure, with their concepts of isomorphism, unity of field structure and the application of the Pragnanz principle. The explanation of the creator's search and his discovery of the formal principles is attendant upon psychoanalytic advance in the theory of sublimation. Sachs has begun here with a stimulating analysis of the role of narcissism as motive for seeking universal standards.

This treatise deals more effectively with certain earlier stages of the creative process: the anxious awareness of the incompletely repressed "dream stuff," the socializing of the unconscious material for communication to others, thus sharing the guilt (since others can then participate in the forbidden fantasies) and the use of techniques for depersonalizing the Id content. These "secondary processes" of the Ego are rather overemphasized, to the neglect of a preliminary creative stage, the Primary process; the essential structuring that occurs at this first level is practically ignored, except for a belated back-hand reference (189). Sachs fails to utilize Freud's extensive analyses of the primitive processes: condensation, displacement, allusion, symbolisms, etc.

The academician will complain of an obvious lack of continuity in the theoretical structure of the book and also of a disappointing unevenness in the depth of insightful analysis for the many issues and phenomena discussed. These are real faults, and perhaps are not entirely attributable to the complexity of the field. However, there is an exciting and satisfying richness in the illuminating applications of what has begun to be understood in several diverse fields of social phenomena. One example is an analysis of Shakespeare's "Measure for Measure" as a comedy just barely saved from becoming an unbearable tragedy through the special handling of the unconscious fantasy material. A challenging sociological chapter suggests that the invention and spread of manlike machinery may have been dependent upon the growth of a more secure "world conception" as a measure against an anxious, narcissistic inhibition of external representations of human animation. Another section carries the problem of animistic release to the realm of movie cartoons. Also a chapter relates several of Freud's writings to the working out of certain of his infantile wish-patterns. No non-psychoanalytical theory of creativeness has shown this wealth of revelance. The theory here is far from completion and further from experimental verification. And Sachs' presentation lacks the quiet deft precision of Freud's writing on these problems. However, it is unquestionably a significant contribution to our current psychological thinking in the field of aesthetics.

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NOTES AND NEWS

James McKeen Cattell, one of the pioneers of modern psychology and one of the distinguished men of our time, died January 20, in Lancaster, Pennsylvania, at the age of 83 years. Dr. Cattell was one of the founders of the American Psychological Association, its Secretary in 1894, and its President in 1895. He was President of the Ninth International Congress of Psychology in 1929. He was a member of the National Academy of Science. In 1888, he became professor of psychology at the University of Pennsylvania, and three years later professor of psychology at Columbia University, a position he held until 1917. From 1917 onward he devoted himself to the editing and publishing of scientific journals. He was editor of *Science* from 1894 until his death; of the *American Naturalist* from 1907–1941; of the *Popular Science Monthly* from 1900 to 1915, and its successor, the *Scientific Monthly* from 1915 to 1941. In 1904 he founded the *Journal of Philosophy, Psychology and Scientific Method*, and in 1915, *School and Society*, which he edited until 1939. He also founded and published the directories, *American Men of Science*, and *Leaders in Education*. In 1924, he was President of the American Association for the Advancement of Science.

Moshe E. Brill of the Hebrew University (Jerusalem) died on December 4, 1943. Dr. Brill was elected an Associate of the APA in 1936, and was our only representative in Palestine.

With deep sorrow the psychology department of Connecticut College announces the death on January 6 of **Dr. Moritz Löwi**. Formerly director of the psychological laboratory and professor at the University of Breslau, Dr. Löwi came to the United States five years ago. He spent two years as research associate at Connecticut College, where he conducted experiments on the psychology of thinking. During the current year, he was continuing his research at the Norwich State Hospital.

James Rowland Angell, president emeritus, Yale University, has been appointed director of the Hall of Fame for Great Americans on the campus of New York University.

Paul C. Young, acting head of the department of psychology, Louisiana State University, has been appointed chairman of the organizing committee of the Louisiana Legislative Council, "an association being formed to promote interest in social progress among state and regional organizations."

Wayland F. Vaughan of Boston University spoke on "Psychology: The Hope of the Future," on Station WGY's Science Forum program November 24, 1943. His discussion was recorded and will be rebroadcast over 269 local stations as a feature of "Excursions in Science."

The University of Kentucky announces a new program in the field of psychology, predicated on the belief that there will be an unprecedented demand for men and women trained in industrial psychology after the war. Because of the return of millions of persons to civilian pursuits, the problem of training in personnel relations becomes of major significance. The program designed for juniors and seniors involves: (a) related courses in different departments of the university as background material, (b) the development of the essential skills and techniques in the psychological laboratories, and (c) actual tryout and practice with cooperating firms and public agencies. **Henry Beaumont** is the originator of the course.

Harold Saxe Tuttle, of the department of education, City College (New York), has been granted a year's leave of absence to write a "pioneer work" in which he "will seek to apply the principle of conditioning to a comprehensive program of education for citizenship."

Richard H. Edwards, visiting professor at Howard University (Washington, D. C.), has been appointed visiting professor at Keuka College (Keuka Park, N. Y) for the second semester beginning February 1 to "conduct special courses of integration in the department of psychology."

Charlotte A. Wright, former assistant dean, Ward-Belmont School (Nashville, Tenn.) has been appointed professor of psychology and religion, Centenary Junior College, Hackettstown, N. J.

Applications to the Committee for Research in Problems of Sex of the NRC for financial aid during the fiscal year beginning July 1 should be received before April 1. They may be addressed to the chairman, **Dr. Robert M. Yerkes**, Yale School of Medicine, New Haven 11, Conn. Although hormonal investigations continue to command the committee's interest, in accordance with current policy, preference will ordinarily be given to proposals for the investigation of neurological, psychobiological and behavioral problems of sex and reproduction.

Barbara Burks Memorial Fund. In the wish to express their appreciation and regard for Barbara Stoddard Burks, whose death has meant a great loss, personal and professional, to many psychologists and geneticists, her friends are establishing a memorial fund. Because of her activities during five years as chairman of the APA Committee on Displaced Foreign Psychologists, it is proposed to use the fund to promote international professional relations among workers in the fields of psychology and genetics—for example, as a loan fund for assistance to European scholars studying or carrying on research in the United States. For the present, administration of the fund will be in the hands of a committee composed of Gordon Allport, Katherine Brehme, Robert Cook, Kurt Lewin, Theodore Newcomb, Lewis M. Terman, Ruth S. Tolman, and Robert S. Woodworth. Contributions may be sent to **Ruth S. Tolman**, 4420 Fiftieth Street, N.W., Washington, (16), D. C.

NOTICE

March 15th is the deadline for the application for transfer from Associateship to Membership in the APA. The deadline for new applications for Associateship is July 15th. Applications for transfer as of March 15th, and for Associateship as of July 15th, will be considered at the September, 1944, meeting of the Association. Usually blanks may be secured from the nearest administrative or departmental office in psychology. In case they are not available, write directly to the *Secretary*, **Willard C. Olson**, University of Michigan, Ann Arbor, Mich.

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A MODERN ACCOUNT OF PROBLEM SOLVING

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I. INTRODUCTION

Although the need for an adequate psychology of problem solving is generally recognized, progress in satisfying the need has been disappointing. One obstacle has been the lack of a suitable conceptual framework within which the experimental evidence can be advantageously arrayed. This paper is an attempt to identify the essential processes of problem solving, describing them in psychologically descriptive language rather than in the language of logic or of controversial points of view within psychology, and to organize the more important literature around these processes.

The topic is the reasonably well specified behavior which occurs when an individual—human or infra-human—engaged in active commerce with the environment meets an obstacle and his activity is impeded. One straightforward line of action is no longer apparent; the individual is faced with alternatives, must pause and choose. If no obvious alternative looks good, the individual may seek, or even construct, other alternatives, then choose among them. Of the many terms often used to differentiate such activity from routine or thoughtless activity "deliberation" is particularly convenient because it has no disturbing logical conntotations—as "reasoning," e.g., has—, because its verb form is relatively unambiguous, and because it has an adjective form which may refer to persons as well as behavior.

Deliberation and learning. In conditioning experiments of the classic type, in most motor learning, and in rote learning deliberation does not ordinarily occur. Instrumental conditioning, as the term is used by Hilgard and Marquis (**59**), includes phenomena often listed under problem solving. Maier and Schnierla (**96**), among others, have objected to such usage. Mastery of complex or difficult material usually calls for deliberation in the early stages—in what Krechevsky (**79**) calls the "pre-solution period"—and for remembering in the later stages. The differentiation which Cox (**24**) makes between mechanical assembling and routine assembling is similar.

It is a fine question whether deliberation is one aspect or kind of learning—within learning broadly conceived—or a separate coordinate process at the same level of analysis. Is it the same process when a rat is running a maze the first time and the thirtieth time? This paper is concerned with that phase of adjustment to a problematic situation in which solutions are found rather than the phase of increasing skill, or perfecting the execution of the solutions. It is obvious—and will not be repeatedly stressed—that the learning process influences mastery of all the materials of thought and the direction and efficiency of all the processes of thought.

Materials and processes. The differentiation between materials and processes, between static and dynamic concepts, which is implicit in much psychological discussion, must be made explicit. Materials, contents or objects of thought are such as perceptions, affects, concepts and complex patterns of these—anything which may be attended to, toward which behavior or thought may be directed. They are useful in analysis because they are the objects and the evidence of mental activity and the form in which the more subtle products of problem solving may be communicated.

The activities of problem solving are extremely diverse. But in the interests of economy certain regularities can be made out, certain kinds or classes of operations on the materials of deliberation. These particularly notable regularities are called processes in this paper. A similar differentiation between materials and processes is observed in physiology. Examples of materials are water, hemoglobin, tissues and salts. Examples of processes are solution, growth, coagulation and digestion. In modern psychology processes are differentiated and identified when they produce different kinds of behavior, when they are differentially affected by experimental conditions, when individual differences in their operation can be statistically differentiated, or when there is common agreement of a subjective nature.

Analysis of deliberation into three processes. On the basis of incomplete evidence, problem solving or deliberation may be separated—for the present review at least—into three processes, or groups of processes, which regularly occur during problem solving:

1. orienting to the problem,
2. producing relevant material, an elaborative function,
3. judging, a critical function.

These processes, and their interrelations during problem solving will be briefly described, then the more important literature will be arranged in reference to these processes.

The first of these, orientation, is a well known but not well understood process. Even quite simple organisms are capable of selecting from the environment certain aspects to be responded to. The complex problems of human concern require effective orientation to the problematic aspects of the situation, and reorientation as deliberation progresses.

"Producing relevant material" refers to a congeries of processes, since the materials of deliberation and the ways of manipulating them are variegated. The material may be produced by perceptual processes, as in the psychophysical judgment, or by affective processes. In many problems some of the material is produced from memory, as in the case of the rat at the choice point, or the student deliberating over the true-false item. Human beings elaborate various intermediary products, such as generalizations and patterns of action, to aid the search for relevant material.

The terminal phase of deliberation is the critical or evaluative phase, involving the selection of one or more of the alternatives elaborated by the foregoing processes. This selection or judgment asserts a relation between aspects of the problematic situation or the elaborated material which renders the situation less problematic (**28**, p. 283), thus releasing the orientation.

The solution of a simple problem is easily described in terms of these three functions. Consider the problem: "*This* is to *that* as *now* is to ——." One subject, as soon as his general orientation to the problem was established by the experimenter's instructions, noted that the problem was of a familiar type. Hardly any deliberation was necessary in selecting a plan of attack. He elaborated relations between *this* and *that*. He judged one of these relations, "opposition," as valuable, then placed *now* as one term of the relation, leaving a blank where the other term should be. With this schema in mind he elaborated words to fill the blank. When the word *then* appeared, he replaced his elaborative activity by critical activity and returned to his original orientation in order to check his solution.

Next, consider a more complex problem, making an equation out of the following: 2, 2, 2, 2, +, =. One usually attacks such a problem as a whole at first, raising the question: What is the best way to approach this problem? The material produced includes programs of action, memories of similar problems, hypotheses and the like. One of these plans is judged feasible. Thus the result of the initial deliberation is adoption of a plan; sophisticated subjects would call it a hypothesis. Let us suppose that the plan adopted is as follows: "I shall place the 'equals' sign in the middle and try various combinations on each side." This leads to the production of new combinations of numbers and signs. Several subjects working this problem judged many combinations unsuitable and were thus inclined to reject their program and search for a new one. The result of this deliberation was adoption of the plan of reexamining each number and sign for a "catch." In a few cases the concept of number was broadened to include exponents. With this additional material it was possible to take up the original plan and reach a solution.

Problem solving begins with the initial orientation and ends with the closing judgment, but between these bounds almost anything can happen, in any sequence. Manipulative aids, intended to facilitate solution of the major problem, may be minor problems in themselves. The mind of man (and other primates), when baffled, is exceedingly flexible. Our account must not restrict its range or sequence of action unduly. Furthermore, if our account is to be broad and lifelike, it must include social problems and problems requiring creative thinking as well as those which have answers in the back of the book.

II. ORIENTATION TO THE PROBLEM

A. Conditions of Orientation

In this paper "orientation" refers to the process by which the organism grasps the material of thought and keeps it available for deliberation. In the lower forms bodily orientation seems to be an important part of the process. The higher forms, with much more cerebral tissue, enjoy more freedom.

Experiments on the delayed reaction in animals and children, such as those summarized by Munn (**106**), give some information on the conditions of orientation. In many experiments on human subjects the individual is oriented toward words or other symbolic representations of certain aspects of the environment. Having something "in mind" is a popular equivalent of "orienting toward" something when the objects of thought are absent or abstract. If a person is given some mixed-up wooden letters to arrange in the form of words, he will not occupy himself with geometrical patterns of the blocks or their color or texture. His activity will be related, more-or-less skillfully, to the meaning of the letter combinations. The orientation facilitates response to some stimuli and inhibits response to others, whether the oriented organism be a lower animal or a man occupied with a mechanical puzzle, or a man occupied with an ideational problem.

In a sense, orientation is the receiving function of mental activity. Responding activities, such as production of the material of thought and the search, will be considered later. The artificiality of the separation of receiving and responding functions of thought may be justifiable at the present stage of analysis.

When the solution is to be passed on to others—the usual case in human deliberation—the thinker's problem will include the defending of his ego or the persuasive phrasing of his solution as well as the on-the-record problem of finding the solution. Mead (**100**) and Piaget (**118**) have stressed these effects of social interaction on thought. Rignano (**123**) uses the term "dialectic reasoning." In other contexts it is called "rationalizing" although hardly any thinking takes place without some such considerations. The important point here is that such motives orient the thinker toward verbalizations, logical forms, and the likes and dislikes of his audience, things which he might neglect if he were isolated from social contact.

Initial orientation. Since the deliberation begins when the organism's activity is impeded, the initial orientation is in the direction of the interference. But a genuine problem implies a detour or, in other words, that the initial orientation is not adequate for solution. The initial orientation and succeeding orientations are dependent upon certain properties of the stimulus field, any one of which could be crucial in solving some problem. Considerable information is available on factors which affect orientation to visual stimuli, such as size, contrast, figure-ground relationships, interests and the like. Some of these, or their metaphorical equivalents, are useful in explaining orientation to ideational stimuli also.

Limitations of orientation. The mind of man is finite, and the amount of material to which one can orient is limited. One does not orient to the details of a movie until one's orientation to the seat is assured. The amount which one can orient to and remember long enough to report is called the "span of apprehension" or the "immediate memory span." Blankenship (11) reviewed the literature on span in 1938. It is only necessary here to point out that the conditions which affect the ability to perceive and report probably also affect the ability to perceive—or produce by some other process—and apply to the solution of a problem. The span has duration as well as extent, although experimental emphasis has been on extent as measured by number of items retained just long enough to be reported. It is an interesting question whether the inverse logarithmic relation between amount retained and time which seems to hold for long intervals will also hold for short intervals. Cook (23) used the disc transfer problem in which increasing the number of necessary moves changes the problem quantitatively but not qualitatively and found that difficulty, as measured by errors, etc., increased as a power of complexity, as measured by minimal number of moves.

Some evidence is available on conditions which disturb the orientation. Chrisof (20) has shown how, when the problem is difficult, people often give up the orientation to the problem in favor of daydreaming or some other substitute activity. Hildreth (58) points out the tendency of deficient children, working on a hard problem, to give up the original problem and look for some easier quasi-solution.

An important condition affecting orientation is called "distraction" in discussions of attention and "interference" in discussions of memory. Maier and Schnierla (95) have a section on attention and distraction in animal experiments. A recent experiment by Pillsbury and Sylvester (119) shows the effect of interference on immediate memory for tachistoscopically exposed material. From analogy with experiments on retroactive inhibition one would expect that similarity of material would increase the possibility of interference. Young and Supa (167) have demonstrated such an effect. They state:

> The memory span for series containing two dissimilar types of material is

longer than the memory span for series containing all of one kind, hence providing empirical evidence that the limitation of the memory span is, at least in part, a function of internal mnemic inhibition.

In Hovey's (62) experiment, where the distracting material was not related to the material of the problem, the effect was negligible.

The importance of this similarity of material in causing interference will become clearer to anyone attempting to solve the following problem.

The ages of a man and his wife are together 98. He is twice as old as she was when he was the age she is today. What are their ages?

When faced by such a problem one gets a feeling of confusion which can be interpreted as due to interference among the items of the problem, inhibiting effective orientation. Several methods are used in combating such interference. In solving the above problem writing down identities and relations in algebraic notation would reduce interference. Vocalization is another method which is often noticed in distraction experiments. The value of vocalization is in fixating the material more firmly—in temporary overlearning, one might say—and thus cutting down interference. On the reversed digit-span test most subjects vocalize the digits in forward order, so as to fixate the digits more firmly before attempting to reverse them. Any method of assembling the material into a pattern will facilitate grasp of the material. The amount of material which one can grasp and manipulate in deliberation is also influenced by one's mastery of the material. School children can work arithmetic problems better when the material is familiar than when it is strange, even though the numerical relations are the same.

The relation of physiological variables to capacity for orientation has not been thoroughly studied. For some interesting speculations on the neurology of attention and the initiation of thought—quite independent of psychological research—see Rosett (**125**). It is safe to say that whatever affects the general efficiency of the organism would affect capacity for orientation. Seward and Seward (**132**) found the effects of alcohol on immediate oral reproduction of syllogisms to be greater than on the syllogistic reasoning itself. It is plausible to suppose that the amount of material which one can grasp and report is closely related to the condition of the cerebral tissue. Changes in orientation seem to be accompanied by changes in muscle tension (**38**, Ch. 23), in Alpha rhythm (**149**, **159**), in bodily movements (**46**) and in rate of winking (**21**).

B. Individual Differences and Development

Many of the tasks on intelligence tests require simple operations on simple material, a fact which suggests that the difficulty lies in maintaining orientation to all the material while engaged in these operations. Counting backwards from 20 to 1, rearranging words in sentences, carrying out three commissions and following simple directions disclose individual differences in this function.

The digit-span test, which requires orientation to several items merely to reproduce them, is widely used and correlates reasonably well with intelligence test scores, according to evidence assembled by Blankenship (**11**). Data on the increase of span during the growth period are available in the texts on genetic psychology. Data gathered by Wechsler (**153**, p. 214) show the increase in span to age 20–24 and the subsequent decrease. The similarity between the age curves for brain weight and test scores, which Wechsler notes (pp. 59–61), would be more convincing in the case of digit span if raw scores rather than standard scores were used. Span is one mental test which can be scored in absolute units.

Some of the developmental studies have considered the temporal dimension of the span—called span of attention or of interest—as well as its breadth. In deliberation over involved problems the temporal dimension of the span may be the more important. Gutteridge (**49**) observed the duration of children's attention to various activities from age two to age six. The close relations between these two dimensions of span illustrate the necessity, in any broad view of thinking, for considering interests and preferences as well as abilities.

To anyone familiar with recent issues in the literature of individual differences, the question arises whether capacity for orientation is one ability or several. Will tests of ability to grasp different kinds of material correlate positively? If span of immediate memory be taken as a measure of capacity for orientation, the evidence is in general affirmative. In Blankenship's review some low and some quite high positive correlations are given. Brener (**16**) gave 17 tests of span, using words, numbers, phrases, and other material, presented in different modalities, and factored the correlations by Thurstone's centroid method. After rotation one factor accounted for most of the variance. Wittenborn (**163**) found a well-defined attention factor in an analysis of 20 tests. The best tests of this factor might be called complications of the digit-span test. They required sustained grasp of numbers and letters while carrying out simple irregular operations on them.

Had Brener and Wittenborn used more abstract material, of the kinds used in problem solving, it is unlikely that the results would have been different. Ability to orient to spatial patterns and reproduce them immediately appears to be a general thing, regardless of mode of presentation (**22**) or of mode of reproduction (**143**).

III. PRODUCTION OF RELEVANT MATERIAL

A. Materials of Thought

The materials manipulated in deliberation may be produced directly from the present situation, as by perceptual processes, or they may be remembered from the past (the learning process), or communicated from other people. Problems can be set up so that any of the processes is the principal determinant of the outcome.

Generalizations are important materials of thought, and the development of generalizations has been treated elsewhere, e.g., Hilgard and Marquis (**59**). But this process deserves brief mention here, because our interest goes beyond the development of generalizations to the use of such generalizations in deliberation.

The significance of generalization, in respect to deliberation, is that several objects of thought may be treated as one. When many particular apples are grouped under the concept "apple," orientation to these apples is facilitated and their manipulation in deliberation as well. Representing a generalization by a symbol, such as a word, facilitates communication of the generalization to others, and probably self-communication and manipulation in problem solving. In fact some writers assert that all thinking involves the use of symbols, although such a broad statement would rule out the solution of many mechanical puzzles.

Since generalizations are so important in thinking, it is obvious that errors of generalization, confusion of symbol and referent, and emotional involvement of the symbol are likely to cause errors in thinking. Some of the insights of the recent work on language, meaning and general semantics have been summarized from the point of view of educational psychology by Horn (**61**).

Although experimentation on such elusive subject matter as the concept is a triumph for psychology, an adequate understanding of problem solving will require knowledge of the development of even higher organizations of data, such as the concept of the self, points of view, frames of reference, and more complex patterns of interrelationships illustrated by the family pattern, the syllogism, and the pattern of industrial expansion. Of particular interest in the present discussion would be experimental evidence on the organization of patterns of the material of the problem and of imagined courses of action carried out in the problematic situation which yield the thinker some foresight of the consequences of such action. A complete psychology of problem solving would include a description of the attainment of mastery of such material.

The elaboration of any of these materials of thought may be a problem in itself, involving any of the thought processes discussed in this paper or, once mastered, the material may be recollected as a unit. The products of today's generalization may be used automatically tomorrow in deliberation over new, more complex problems. Long and Welch (**88**, **89**, **154**, **155**), in a series of studies of generalizing, have given special attention to children's hierarchical use of simple concepts to build more complex concepts at a higher level of abstraction.

B. Two Elaborative Processes

1. The Search. If the thinker can be assumed to have a variety of material or responses in his repertoire, the central question now becomes: How is the relevant material selected and manipulated so as to produce a solution? For the material produced is rather relevant. The behavior of most individuals—human or less—indicates that they do not sample the responses in their repertoires at random; their behavior shows some continuity and some point. The search is narrowed down to the likely places or ideas. This relevance of thinking has intrigued students of the higher mental processes for years, and a name, the "determining tendency," has been given to whatever it is that facilitates the production of suitable material and inhibits the production of the grossly unsuitable.

The present paper separates the activity which the determining tendency was intended to explain into two parts. The orienting function, described above, keeps certain stimuli or objects of thought available for deliberation, either in sight or in immediate memory. The responding side of deliberation can be treated as a search within the material in the perceptual environment or assembled in immediate memory or both, for a solution—followed often by evaluation of that solution. The solution sought may be a certain object or movement, a relation between objects or ideas, a reorganization of all material at hand, or some other way to make the situation less problematic.

The search may take many forms, depending upon the requirements of the problem, and various kinds of search have been exploited by various writers. Spearman (**134**) has studied the search for relations and correlates in many fields of creative endeavor. Maier (**91**, **94**) is particularly interested in a synthetic search, "a combination of isolated experiences." Gestalt psychologists emphasize a search which results in a reorganization or recentering of the material. This is the crucial process in many problems, according to Wertheimer (**156**). Most generally, the activity of the higher vertebrates, including man, in a problematic situation can be characterized as a search for a way out. If the problem is complex, necessitating a detour, the individual's search varies. He alternates, perhaps, between a synthetic search and an analytic search, later reorganizing the whole thing to get his bearings before setting off on a search of a different sort.

The difference between search of a situation and immediate perception of the situation was noted by Hunt (**63**) in an introspective study of the observation of pictures and geometrical designs and by Freiberg (**39**) in a study of auditory stimuli near the threshold.

A number of concepts have appeared in the literature to account for the direction of the search and for the relevance of the material produced. This appears to be an open field for the development of new psychological concepts. Actually, however, the literature of this phase of thinking can be treated under two headings: the *search model* and *plans of action*.

The search model. An introduction to the literature on the search model or schema is given by Woodworth (**164**, p. 798 ff.). The next task is a description of the role of the search model in problem solving. The individual does not just search. Acceptance of an *Aufgabe* implies a search *for* something. The search model is a pattern of the requirements of the solution as these requirements are understood by the thinker. All the higher species are capable of acting selectively toward the more relevant aspects of a situation. Man is capable of mental manipulation of absent objects, i.e., of their representatives, and of manipulation of concepts and other abstract material in immediate memory. The search model is patterned from the relevant aspects of the situation and abstracted from the total situation, much of which is irrelevant and confusing. It is anticipatory in the sense that a pattern is abstracted with a gap to be filled.

The jigsaw puzzle gives a nice illustration of the use of the search model. Looking over the assembled pieces the puzzler builds up a pattern which partially outlines the necessary piece. With this pattern as a guide the puzzler searches among the spare pieces for one that will fit. It is important to note that he does not try to fit all the visible pieces into the pattern. Those pieces which are obviously unsuitable do not attract his attention, while the likely ones "jump out" at him.

The artist, the architect, the scientist and the poet, all are aided by search models of varying degrees of definiteness, which change, of course, as the search progresses. Spearman (**134**) gives many examples of artistic and scientific search illustrating the use of a schema made up of a fundament and a relation, the thinker to find the other fundament. Cox (**24**) uses Spearman's concepts in his analysis of mechanical assembling. In some perceptual problems the pattern of the search model need not be separately constructed, but is perceived directly. Gestalt psychologists have emphasized this phenomenon and have invoked the principle of "closure" in filling in the schema.

Faulty construction of the search model is, no doubt, responsible for errors in the search. "A question well put is half answered." Titchener (**148**) in 1924 attributed the overlooking of familiar objects to an "unsuitable image." Kingsley (**74**) found that lack of agreement between the subject's idea of the object of search and the real object often retarded discovery. In a later study (**75**) he gave the subjects a small picture of the object sought and believes that this facilitated the search.

If the construction of the search model depends on such processes as generalization and pattern formation—as seems likely—knowledge of these processes is pertinent. The search model may contain more, or less, than the actual requirements of the solution. As in generalizing, the more striking specifications of the solution may be included, and the more subtle ones overlooked. Prejudices and values will enter in because the individual abstracts the search model from the situation *as he sees it.* Certainly in seeking a solution for social problems the social environment of the thinker is interiorized and represented in the search model. Illustrations of the effect of the *Zeitgeist* on the thinking of early psychologists are given in the last chapter of Boring's (**14**) recent history and in a recent review by Murphy (**108**). The history of philosophy and social theory gives many others. It is likely that there is more opportunity for error when the search model is constructed routinely, instead of deliberately.

The material of the search model need not be the same as the material of the problem. The solution of syllogistic problems is often aided by a visual schema. Rignano (**123**, p. 73) gives a good example of a visual pattern formed by lining up all the inhabitants of London side by side in order to verify the proposition that there must be two who have the same number of hairs on their heads. In a reasoning experiment with geometrical figures, however, Bowers (**15**) found that visual imagery was of no apparent value. Ruger (**126**) also minimized the aid of imagery in working three-dimensional problems. Verbal aids, on the other hand, are known to be definitely helpful in mechanical problems and mazes.

The material of the problem and relationships within the material are often put into verbal form, and from this verbalization the specifications of the solution may be verbalized. "I have to push the small ring off the pin without disturbing the string." Bentley (**7**) has stressed the importance of self-instruction in the search. In the protocols of the thought experiments are indications of a wide variety of devices used to get a purchase on the material of the problem. In many instances these devices are ways of assembling the material of deliberation so that the requirements of the solution may be visualized or otherwise formulated.

Plans of action. When the problem situation is so complex—together with the elaborated material—that the thinker cannot pattern the specifications of the solution to the whole problem into a usable search model and seek a solution directly, his initial attack is inadequate and he must elaborate other plans of action. Nearly all thought experiments give evidence of analysis of the problem situation into smaller problems and of the elaboration of alternative techniques or plans of action when the first attempt has proved inadequate. A common technique is to search first for the cause of the difficulty, a procedure called "locus analysis" by Ruger (**126**) and "penetration" by Duncker (**31**) and Wertheimer (**156**). Durkin (**32**) gives other techniques. If the problem involves physical objects, the search is often aided by manual manipulation of the objects, random or planned. "Vicarious trial and error" could be considered a compromise between mental and muscular exploration.

Another common pattern of activity is to accept a solution tentatively while testing its consequences. The thinker may, even before seeking a solution, seek a way of putting the data into patterns which can be easily held in immediate memory and manipulated. For example, if the problem is one of evaluating a solution, it is relatively easy when the material is presented in a convenient pattern, but difficult when the material must first be rearranged (**18**).

These and other plans of action may be invented *ad hoc*, with the aid, perhaps, of a highly abstract search model, or they may be transferred from previous searches. Evidence for the mechanization of the plan of action has been given by Luchins (**90**). Many of his subjects learned a plan of action so thoroughly in a few trials that they followed it mechanically into failure even though simple solutions were obvious.

2. The "free" play of thought. The length of time thought is controlled or goal-directed, e.g., by a search model, is usually overestimated. Protocols are sprinkled with irrelevant comments and asides. If thought experiments dealt more often with social problems and problems requiring creative thinking, the overestimation would be corrected. Illustrations of the elaboration of material without deliberative control are suggested by the terms "trial and error" and "free association."

One result of the many experiments on "trial and error" *versus* "insight" is the general finding that, when the situation is beyond the organism's capacity for insight, i.e., when the organism is unable to pattern the specifications of the problem into a search model, activity will proceed in a more-or-less random way. Other likely reasons for reduction of control are the natural variability of the organism—since control requires a high degree of integration—and decrease in motivation.

It would be desirable to have more information on elaborative processes of the uncontrolled type. Pertinent information from the literature on association experiments, as summarized by Woodworth (**164**), is meager because the interest in association experiments, when they were done, was quite different from our present interest. What is needed is more information on association between plans of action, between forms, and between words expressing relations, as well as between words like *chair* and *needle.* The importance of free association in problem solving can be seen more clearly by considering representative problems.

"Make as many words as you can out of *establishment.*" Controls of the kind described above are not operative. If a man's eye lights on *ment,* will he think of *mental, mint, men,* or *cement?* If the problem is to design a fireplace for a certain house and the designer, in one of his less disciplined moments, is idly looking at pictures of old Norman fireplaces for inspiration, what principles govern his associations? Or suppose an adolescent is frustrated in his attempts to achieve social status in the conventional ways, which way will he turn next for a solution? Information on these principles may be of equal importance with information on controlled search.

Certainly "uncontrolled" thought is determined somehow. Psychoanalytic investigations have shown that affective factors and strivings influence the free play of thought. The phenomenon of "resistance" occurs regularly during psychoanalysis. The success of the projective techniques in personality study indicates that apparently uncontrolled perception is determined by deeper processes. Recent experiments show that hungry people are more likely to see food in ambiguous pictures than well-fed people (**87**, **127**). In a study of the words used in reporting responses to music—to which they were led by their previous studies of synesthetic thinking—Karwoski, Odbert and Osgood (**72**) found that the frame of reference was an important determiner of this rather "free" sort of thinking. Under the influence of various frames of reference the polarity *soft-loud* might be associated with *thin-thick, down-up* or *far-near.*

C. *Creative Thought and Imagination*

Such terms as "creative" and "reproductive" are relative terms, referring to position on a continuum. In the same sense that there is nothing new under the sun there is no response that exactly reproduces another. These terms are used to emphasize the relative presence or absence of novelty in the outcome of a search and as such are quite clearly used, though the judgments of the thinker and society may differ. The thinker has intimate knowledge of the processes of creation —at least he thinks he has—and bases his judgment of originality on such knowledge. Others lack this knowledge and must judge the product only.

One would suspect that controlled thought would be less likely to lead to creative accomplishment than the freer sort, but this may not be so. Novelty is included in the specifications for much creative thinking, particularly in the arts. In both artistic and scientific creation the search model may be explicit in regard to certain aspects of the solution and permit, perhaps require, variation in others. The writing of a sonnet requires originality in content and adherence to tradition in form.

Two poems about morning collected by Mearns (**101**, p. 22) neatly illustrate explicit avoidance of the hackneyed by a high school girl. One stanza of the first poem, called B. C. (Before Cliché) follows.

I watched a fluffy cloud drift by
Across the boundless blue of sky
And saw the sun's rays, molten gold,
Upon the dewy earth unfold.

The next poem, called A. D. (After Discovering 'Em), is a revision of the first after the author had heard the word *cliché* and had discussed clichés in poetry.

I saw the sun with battered face
Trying to warm the human race;
I watched a sodden cloud limp by
Like some discouraged custard pie.

This brings the discussion to the very important topic of creative imagination. In the light of the present account of thinking creative imagination is not a different process from the others discussed herein, but a search which is free enough to yield a solution new to the searcher, yet controlled in such a way that the product will be cherished.

Unfortunately little evidence is available on conditions which foster or inhibit such a search. No doubt a wide range of experience facilitates imagination. Teachers of art and literature often emphasize this point. It is easy to find exceptions, too. Many good love lyrics have been written by inexperienced spinsters.

It is likely that some methods of teaching the arts foster imaginative self-expression more than others. Fox and Hopkins (**37**) have discussed this problem and have put forth some methods for teaching music creatively. Ralph Pearson (**117**) teaches painting by stressing creative design and imagination from the outset, rather than representation. Teachers who have used his methods report more imagination and freedom of expression in their students. It is possible that emphasizing representation at the beginning restricts the finding of anything nonrepresentative in later searches.

Hutchinson (**65**) surveyed the materials for a study of creative thinking in 1931. Recently he (**67**) has discussed the period of frustration in creative endeavor and its relation to abnormalities. He has also described (**68**) the conditions and characteristics of creative insight from personal documents of artists and scientists. Markey (**97**) reviewed the literature on imagination in 1935. Some general texts in psychology, e.g., Stern (**136**), give good introductions to the problem, but empirical data on imagination as a psychological process, comparable to the data on learning or perception, are meager.

Winch (**160**) in 1910 reported some transfer between memorizing short stories and inventing new stories. Feingold (**36**) studied the effects of suggestions on the responses of five subjects to ink-blots. The responses did not follow the suggestions as often as expected. The suggestions cut down the number of responses, especially the more specific suggestions. Grippen (**47**) studied the artistic output of superior children with the aid of stenographic records, and found some of the sources of artistic conceptions—in travel, pictures and the immediate environment—and something of how these are elaborated, fused and composed. An approach to the problem of the motivation of imagination has been made through a study of the hypothesis that children conjure up imaginary companions because they feel a lack of more real companions (**6**, **64**, **139**). But the results are not conclusive.

These investigations have not gone far, but they—and the studies of individual differences to be mentioned later—indicate that the conditions of imaginative response can be investigated experimentally, as well as those of response which is right or wrong.

D. Temporal Relations in the Search

Several writers (**20**, **31**, **141**) have suggested general sequences or stages of thought. Cox (**24**, pp. 183–194) has described stages in solving certain mechanical problems. Heidbreder (**56**), however, found no uniformity in the discovery of rules. If the present account of problem solving is correct, no uniformity is to be expected, except in the minor ways to be described in the next few paragraphs.

Patrick (**116**) found that the creative search of her poets and artists usually went from general idea to specific detail. There were many exceptions. Sargent (**128**) found a similar sequence. Simple anagram problems were grasped as a whole and solved by "immediate reorganization." On the more difficult problems his subjects used the whole method first, then a piecemeal attack. One safe generalization is that "locus analysis" and any restructuring of the problem are followed by a new plan of action.

The solution of many problems can be described as a fluctuation between mental and muscular manipulation (**24**, **126**). Heidbreder (**56**) found participant behavior four times as frequent as spectator behavior in the discovery of rules. Spectator behavior she describes as a kind of receptiveness to leads, often following failure, apparently due to lack of a hypothesis.

Designing a fireplace, an illustration of creative thinking previously mentioned, shows the alternation between controlled search and the freer sort of thinking. The designer might stumble on a happy idea for the face of the fireplace, after which his knowledge of the requirements of balance and practicality would control further search. Contrariwise, controlled thought might determine the general design of the fireplace and limit his fancy to decorative effects.

Robinson (**124**) found in the anagram problem that the length of time a subject followed a plan of attack varied with (1) the confidence felt in that plan and (2) the number of alternatives available. Heathers (**55**) has noticed that rats avoid repetition in a maze in which both alleys are rewarded. Goodfellow (**44**) reports similar tendencies to variation of response in the judgments of human beings.

Krechevsky (**77**) has some evidence that rats solve a discrimination problem by a systematic search, following for a while various leads, or at least orienting successively to different aspects of the situation. Whether such a procedure should be called a hypothesis is disputed (**135**, **161**, **162**). Witkin's (**161**) conclusion that there are more shifts in direction when the situation is complex agrees with Robinson's findings noted above. Long and Welch (**88**) find objective evidence for systematic search in children working a generalization problem. Lashley (**81**) has discussed these topics in some detail in respect to discrimination learning in the rat. Studies of the behavior of rats at a choice point (**25**, **105**) indicate that deliberation is longest and "vicarious trial and error" most frequent just before errors start to decrease.

E. Availability of Material

The material in the thinker's repertoire prior to deliberation on any specific problem is an important factor in the effectiveness of the deliberation. Information from learning experiments, as suggested by the terms recency, frequency, reflex reserve and extinction, is pertinent.

But often material in the thinker's repertoire is not brought into immediate memory and made available for deliberation. It is likely that some sort of interference blocks the search frequently. Possibly the dual orientation to the search and to the original problem is too great a task. Some such interference can be noted in a common classroom demonstration.

> Consider the problem: "Draw a quadrilateral of such shape that you can draw a straight line through all four sides." Students will usually draw quadrilaterals of rather conventional shape and thus cannot solve the problem. If told to neglect the problem temporarily and "draw the most peculiar quadrilateral you can," they will often be able to solve the problem.

It seems that starting the search in one direction blinds the thinker in some way to the possibilities of other directions. There is an analogy here to the influence of the "final common path" in neural integration. Ruger (**126**) noted that his subjects, working on three-dimensional problems, often made fatal assumptions of the nature of the problem or place of solution at first glance and were unable to change thereafter. The subjects in Luchins' (**90**) mechanization experiment on number and word problems showed a similar rigidity. Maier (**93**) was able to produce more solutions in an experimental group of subjects by instructing them to guard against persistence of direction. His interpretation is that many failures are due to an actual inhibition of the variation of the search. Illusory partial success, as Cox (**24**, p. 180) noted in his investigation of mechanical assembling, may narrow the search prematurely.

If the material is embedded in one configuration it may not be available for use in another (**130**). This applies in perception, as the Gestalt psychologists have pointed out, also in generalization (**42**) and in the completion of jokes (**54**). Whether words are configurations in this sense is disputed (**27**, **60**, **111**, **128**). Hanawalt (**50**) has recently shown how practice improves the ability to pick a simple design out of a more complex design in which it is embedded. Katona (**73**) has a section on availability and embeddedness.

There are ways of avoiding such limitations of variation in the search. Platt and Baker (**120**) found, by a questionnaire study of research chemists, that 60% would purposely give up a problem for a time in order to solve it. Success of thinking following an incubation period, which Patrick (**114**, **115**) observed in the creative thought of poets and artists, suggests that the interferences may drop away during the period of abandonment. Hutchinson (**66**, **67**) has emphasized this possibility also. One explanation is that the initial search model is inadequate and the search thus channeled in a fruitless direction. Abandoning the problem may promote the formation of a more adequate search model for the next attempt.

Probably frustration and emotion limit variation in human thinkers as they do in the rat (**35**). Ruger (**126**) stressed the importance of a confident "problem attitude" as opposed to "self-attentive" and "suggestible" attitudes. Heidbreder (**57**) found that adults were more objective about problems than children. Updegraff and Keister (**151**) observed that success on a few problems will increase a child's confidence in attacking other problems.

Extirpation studies (**78**, **80**, **92**) indicate that the intact animal can vary his responses, i.e., is less stereotyped, than those with brain lesions. Maier (**94**) has written a systematic discussion of the conditions of variability in problem solving.

The affective tone of the material will influence its availability in deliberation. It is no longer necessary to labor the point that most thinkers systematically repress and distort material which is unpleasant to them. Likewise, the utilization of material communicated from another person is influenced by the prestige of the other person, his delivery and other personal characteristics.

F. *Individual Differences and Development*

There is little evidence on individual differences in the processes discussed above, chiefly because thinking has not often been studied analytically, in such a way that individual differences in the production of material for deliberation can be separated from individual differences in mastery of the material or in orientation. Until recently it seems that students of individual differences in intellectual function have been dominated by a schoolmaster's concern for the correctness of the response to the neglect of the processes by which the response is produced. What information there is should be organized, however, and the gaps pointed out.

Individual differences in formation of the search model are of significance. Cultural biases incorporated in the search model, for example, lead to individual differences in the solutions reached. The modern American farmer, looking for the cause of crop failure, will not find the same answer as the Dobu Islander. A Marxist's solution for unemployment will be different from that of an "economic royalist."

Individual differences in elaboration of plans of action are illustrated by Chant's (**19**) experiment. Among his subjects those with scientific training were more likely to use an analytic approach than the others. Hanfmann (**51**) has studied personal patterns in this sort of thing in a generalizing problem, using the Vigotski blocks. Some of her subjects used a conceptual approach, developing hypotheses from detached consideration of "what characteristics blocks have." Others used a more perceptual approach. She later reported (**52**) that women were more perceptual than men. Individual differences in the use of aids to the search, such as search models, hypotheses, verbal and visual aids, and techniques of resisting interference, no doubt contribute to individual differences in the outcome of the search. The habit of making such aids explicit may be a factor of considerable importance. R. H. Seashore (**131**) has discussed some of these factors under the name of "work methods." Sargent (**129**) likewise. Yacorzynski (**166**) reports a technique for investigating the "degree of effort" used in the solution of a problem. Recent analyses of individual differences in the maze learning of rats (**41, 150, 157**) disclose the explanatory value of factors such as these. In general it appears that the brighter rats make more use of the higher cognitive techniques.

There may be general preferences for some techniques of search rather than others. Some may prefer a creative to a reproductive search. Perhaps a "man of action" would show a higher ratio of muscular to mental manipulation.

If mental activity during problem solution does alternate between controlled search and free association, information on individual differences in association is pertinent. The literature on this subject, however, most of which is covered in Whipple (**158**) and Symonds (**140**), discloses little of value to this discussion. The kind of information which fits into this account is illustrated by Murphy's (**107**) 1917 study. He classified other-word associations of graduate students and faculty in various departments and found that those in the science departments were more likely to give opposites and coordinate responses than those in the literary departments. If this is a general difference between these groups in the free play of thought, it will affect their solutions of complex problems.

Individual differences in imagination and creative ability have been studied now and then, and some informal tests have been described. In tests of imagination the stimulus material, whether verbal or pictorial, is more or less unstructured serving—together with the instructions—chiefly as a standard starting place and starter for mental activity. The material may be entirely unstructured and ambiguous, as in the various ink-blots, and Miles' (**104**) Kinephantoscope, or merely incomplete, as in the many varieties of the completion test (**13**, **102**, **138**, **147**) and tests of linguistic invention (**158**). Words may be imaginatively constructed also from ambiguous stimuli presented in auditory form (**33**) or in visual form (**133**). Boraas (**12**) gives other interesting informal tests of imaginative thinking. Quantitative scores are obtained from the amount or rate of production, and such scores have been taken as a measure of the fertility of imagination. The responses may also be qualitatively classified in order to disclose additional data on the thought processes or, as with the projective techniques, to illuminate the underlying personality structure. Such tests have not been widely used, and the customary data on reliability and validity are lacking.

Andrews (**4**) stimulated imagination in preschool children by showing them pictures and designs. She found it possible to get reliable ratings for quality of imagination on a scale running from "no imaginative play" to "personification" and "construction." Tendency to produce unusual responses correlated .87 with quality of imagination. Markey's (**98**) study of imagination in young children by analysis of diary records, observation during free play, and observation in controlled situations shows the correlation of imaginative response with MA and CA. She found that the child is likely to exhibit more imaginative behavior if he plays with older children, and that children of lower socio-economic status are more prosaic. Jersild and others (**69**) give percentages for the incidence of several kinds of fears, wishes, dreams, etc. in children of various levels of age and intelligence. Griffiths (**45**) used a clinical method which led her to stress the gradual development in imagination from a piecemeal indirect attack on a problem to a more socialized expression at the level of overt action and adaptive behavior.

Meier and his students (**30**, **99**, **102**, **146**, **147**), working with older groups, have described several tests of artistic ability and have used these in comparing the artistically superior and inferior. Meier (**103**) summarized these studies in 1939 and listed the factors in artistic aptitude. Lehmann and Ingerham (**82, 83, 84, 85, 86**) have reported considerable evidence on the ages of greatest creative output in several fields of endeavor.

Probably more information on the development of imagination will accrue as studies with the Rorschach and other projective devices continue. Klopfer and Kelley (**76**) in their book on the Rorschach have a chapter on intellectual aspects of personality. Amen (**3**) found that nursery school children's interpretation of ambiguous picture material "in terms of inner activity, thought or feeling, is a more mature pattern of interpretation than interpretation in terms of outward activity."

The question of a general "faculty" of imagination has been studied, and some positive evidence from intercorrelations has been reported (**5, 53**). Positive correlations of varying magnitudes have been reported for imagination and intelligence (**4, 13, 98, 147**). Correlations between imagination and other tests have also been reported (**30, 146**).

The relation between individual differences in the free play of thought and in controlled search has aroused some interest. To eliminate variation in mastery of the material and emphasize differences in the thought processes Johnson and Reynolds (**71**) set up a factor analysis of ten verbal tests involving various degrees of control of the response. Two independent factors emerged: flow of words and control of words. The first was best tested by the command: Write as many words as you can in three minutes. The second was tested by a vocabulary test. These are similar to, but perhaps not identical with, the two verbal factors, W for word fluency and V for verbal comprehension which Thurstone and Thurstone (**144, 145**) have found.*

IV. Problem-Solving Ability

The conventional organization of psychological knowledge—in the technical journals as in the textbooks—puts intelligence and intellectual abilities in a separate chapter, quite unrelated to the chapter on thinking. Since intelligence, however, is usually defined as capacity for adjustment—meaning adjustment to a problematic situation—there is no serious objection to equating general intelligence with the ability to solve the general run of human problems. Items on intelligence tests are mostly minor problems to be solved or tests of processes and materials used in solving problems, e.g., span and concepts. From this approach the most fruitful analysis of intellectual ability would be the identification and description of the various higher mental processes and of individual differences in their operation (**70**). In accord with this approach individual differences in orienting, searching and imagining have been considered along with the descriptions of these processes.

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* The third main process, judging the adequacy of the elaborated material, should logically be considered at this point. But the experiments on judgment have used other kinds of material, e.g., weights and sounds, hence the psychology of judgment contributes little at present to the understanding of problem solving. For this reason and because of space limitations the critical phase of deliberation will not be treated in this review.

As mastery of the technical details of the study of individual differences has increased, attempts have been made to study the more significant individual differences, i.e., those most directly related to the solution of man's problems. Many of these tests have been described by Glaser (**43**) and by Symonds (**141**). It is necessary here only to illustrate the kinds of tests being developed from this point of view.

Reasoning tests made up of logical exercises are well known. Arithmetic reasoning tests are common also. Recently tests of non-verbal reasoning have appeared and have been subjected to factor analysis (**10**). Some of the new tests stress self-criticism and avoidance of the irrelevant and prejudiced (**40, 152, 165, 169**). Tests of interpretation of data in special fields are available, e.g., in chemistry (**110**). Tests of scientific attitudes, interests and habits of thought have also been attempted (**26, 112, 113, 142**). Collections of common superstitions in the social studies as well as in science are available (**121, 122**), and can be used as tests. A few tests, including features of the foregoing tests, are called tests of scientific thinking (**29, 168**).

Validation of such tests is difficult. It is hard to say just what such tests measure because they have not been extensively used and analyzed. The central question is whether these new tests are testing more significant processes of thought than the older tests or merely mastery of different kinds of material. Certainly they should be compared with each other, with tests of reading and vocabulary, and with ordinary achievement tests on similar material. The question of superstitious thinking, for example, is not whether some people believe more superstitions than others, but whether there are habits of thought which make some people more likely to acquire such superstitions than others in the same culture.

Billings' (**9**) method is of interest in this connection. He raised the question whether there is a general problem-solving ability which operates on different kinds of material. Since mastering the material of the problem is considered a different process from problem solving, he endeavored to isolate problem-solving ability by giving his subjects instruction in the material of the problems beforehand. By this method he found a general factor of problem-solving in eight fields as diverse as arithmetic, physics and sociology. The average intercorrelation was .67, and Billings noted that the correlations between the problem solving tests and the subject-matter tests in the same field were lower than this. Such an approach is interesting and bears repetition.

Tests of the higher mental processes need not be limited to measurement of capacity, but may include measurement of the personality or "style" of thought. The term "intelligence" could be broadened to refer to variations in habits and preferences as well as capacities—as implied in such older phrases as "a precise intelligence" and "a prosaic intelligence." Stoddard's (**137**) definition of intelligence includes such factors as resistance to emotion. Wechsler (**153**) included performance items in his battery of intelligence tests in order to bring out temperamental factors. There is good argument, of course, for restricting the term "intelligence" to the narrow meaning and using "mentality" for the broadened concept.

Recent factor analyses of personality inventories have resulted in factors such as "intellectual leadership," "intellectual independence" and a general preference for thought rather than action (**17**, **34**, **48**). Rorschach analysis, as by Klopfer and Kelley (**76**), leads to many statements about the style of thought, some of which are certainly deserving of attempts at validation.

It would be worthwhile to study the relation between individual differences in thinking and other personality variables. Kinds of reaction to frustration, for example, may depend upon intellectual factors as well as motivational and emotional. Biber and others (**8**) give detailed reports on the problem solving activities of a few children and the relation of these activities to the children's personalities as shown in other situations. On the basis of classroom observation Abel (**1**) has described several "modes of thinking" and their relation to classroom adjustment. Murphy and Likert (**109**) postulated a trait of "bookishness" to account for the greater liberalism of the more scholarly students. Such traits are worth taking seriously.

A test for the ability to adopt a new point of view could be constructed; Piaget (**118**, Ch. 3) has made a beginning. Stern (**136**, p. 312) speaks of four types of intelligence: reactive-spontaneous, objective-subjective, analytical-synthesizing and cognitive-practical. If there really are such types, or continua, it should be possible to devise tests for them. The problems involved in the construction and validation of a test of the style of thought—and the limitations of such a test—are practically the same as those of a personality test. And it is likely that some traits of thought are not "common traits" in Allport's (**2**) meaning of the term. Certain techniques of deliberation, for example, may be characteristic of an individual, but unique to him.

V. CONCLUDING STATEMENT

The tools of thought—in the terms of a common metaphor—are the search models, hypotheses, patterns of action and other devices for grasping, cutting out and manipulating the raw material. But the "stuff of thought" may be more than raw material; the craftsman may use concepts, frames of reference and biases which have been fabricated previously, either by himself or others. The skilled craftsman uses his tools scrupulously, keeping them sharp and adjusting them to the task at hand.

The foregoing account of problem solving makes a differentiation between the materials of thought, which are extremely diverse, and the processes of thought, which are few. Intellectual abilities are treated as individual differences in the functioning of the processes of thought. Such an organization of the field permits a description of problem solving in general terms—in the broad way in which such an important topic should be treated—and furnishes a convenient plan for ordering the literature.

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A NOTE ON THE PROPOSED BY-LAWS FOR A RECONSTITUTED APA

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The recommendations of the Intersociety Constitutional Convention of Psychologists, including a proposed set of By-Laws, were recently published in the *Psychological Bulletin.*[1] It is proposed that a mail vote be taken this Spring and that final action be taken at the meetings of the societies involved in the Fall of 1944. Since war-time restrictions have made it necessary to hold a skeleton meeting during the past few years, and since it appears probable that a skeleton meeting will be held this year, psychologists will be asked to vote by mail upon important and fundamental changes in the constitution of the existing APA without ever having had the opportunity to discuss the necessity, desirability, and implications of the proposed changes in an open meeting of the members of the present organization. For this reason it seems highly desirable that the pages of the *Psychological Bulletin* should be made available for comments, criticisms, and free discussion of the proposed changes. And for the same reason, it appears to me highly desirable and of the utmost importance that no final action should be taken this year or any year until it is again possible to have free and public discussion at a meeting of the full membership of the APA. At the skeleton meeting held at Evanston, Ill, in September 1943, only 38 of the 760 Members of APA were present.[2] According to the By-Laws under which the APA now operates, this number does not constitute a legal quorum (Article II, section 4). That the final fate of an action as important as the one contemplated should be left in the hands of so few psychologists is highly undesirable.

The comments below are intended to call attention to the fact that the proposed By-Laws involve several fundamental changes in the existing APA in the hope that consideration of the implications of these changes may lead others to believe in the desirability of postponing action until public assemblage of psychologists is once more possible.

I. Comments on Article II of the proposed By-Laws. Membership

The present APA consists of three classes of persons: Members, Associates and Life Members. In the reconstituted APA all persons are referred to as members; these are divided into three classes: Fellows, Associates, and Life Members. The Fellows of the reconstituted APA correspond to the Members of the present APA except that Fellows have fewer privileges than do the present Members. The Associates of the reconstituted APA are not at all comparable with the present Associates because the proposed Associates have all the privileges of the Fellows. Life Members of the present and proposed association are approximately the same. Some details concerning these differences or similarities are discussed below.

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[1] *Psychol. Bull.*, 1943, **40**, 621–647.

[2] Proceedings of the fifty-first annual meeting. *Psychol. Bull.*, 1943, **40**, 650.

(a) *Fellows.* Fellows in the new APA would be approximately equivalent to the present Members except that their privileges and rights have been restricted. Both present Members and proposed Fellows are granted "all rights and privileges of the Association without restriction" (present By-Laws I, 2; suggested By-Laws II, 2). The structure of the reconstituted APA is such, however, that proposed Fellows actually have fewer privileges than present Members. The present Members are entitled to attend the annual business meeting, to discuss proposed actions, to vote on all actions, and may also introduce a motion from the floor if they so wish. In contrast with this, the Fellow of the proposed APA may attend certain meetings of the Council of Representatives but he does not have the privilege of discussion, of voting on proposed actions, or of initiating action as an individual member in the Association as a whole. The proposed Board of Directors is no longer elected by Members, i.e., Fellows, but is elected by the Council of Representatives and a Fellow has the privilege of voting for only his Divisional and Regional Representatives. (See below comments on the Council of Representatives.) Fellows of the proposed Association, then, actually have fewer privileges and rights than present Members.

(b) *Associates.* According to the proposed reconstituted APA: "Associates shall be entitled to all the rights and privileges of the association except those specifically denied them in these By-Laws" (Article II, 3). On examining the By-Laws it is discovered that *no* privileges are denied Associates. Voting for Divisional representatives, holding Divisional office, holding APA office, are all restricted to members but the class of member (Fellow, Associate, or Life) is not specified; thus the Associate member has all the privileges of the Fellow or the Life member. It is theoretically possible for the President of the APA or for a majority of the Council of Representatives to be Associates who are graduate students. Since the Council has full power over affairs of the Association, it is thus theoretically possible for graduate students to have control of the Association. I do not think that this is likely to happen but the fact that the By-Laws do not specifically prevent it seems to be a fundamental weakness. As the APA is now organized, full Members have certain privileges which Associate members do not have, specifically: voting, holding office and paying four dollars a year more dues than the Associate. In the proposed reconstituted APA the only "privilege" of the Fellow over the Associate is that of paying five dollars more dues each year.

(c) *Life Members.* Life Members are approximately the same in the present and proposed By-Laws except that, in the proposed scheme, either an Associate or a Fellow may become a Life Member while in the present organization only a Member may become a Life Member.

II. Comments on Article IV: Council of Representatives

The APA has been a strong centrally organized society. It is the largest Psychological Association and I believe its dominance should be recognized in the reconstituted society. The By-Laws of the proposed reconstituted APA are written so as to greatly weaken the society as a whole and to give proportionately great power to Divisions which represent special interest groups. The proposed By-Laws are so written as to give unusual power in the control of the affairs of the Association as a whole to these special interest groups, particularly to minority groups. The legislative powers of the proposed APA are given to the Council of Representatives, rather than to the Members as at present. The Council of Representatives is thus an extremely important and powerful body in the reconstituted society. It is important to consider, then, how well this body will serve the interests and needs of the Association as a whole.

Every Division is entitled to at least two Representatives, the Division Chairman and Secretary. Additional Representatives may be elected by the Division depending upon the number of members of the Division who are also Associates and Fellows of the Association. But a large Division can not elect a duly proportional greater number of Representatives. For example, a Division of only 50 members would have two Representatives on the Council (the Chairman and Secretary of the Division), while a large Division having 1200 members would be entitled to a total of only six Representatives (including the Chairman and Secretary of the Division). Thus, in this hypothetical example, a Division with twenty-four times the number of members has but three times the number of Representatives. The relative power of the small Division in legislative matters affecting the Association as a whole is quite disproportionate to the number of psychologists belonging to that Division. Minority groups are thus given relatively great power in the Association.

Not only does the proposed constitution give unusual power to minority groups, but it also enables a member to vote for Representatives of every Division of which he is a member. The combination of these two conditions would make it possible for a small number of aggressive persons to gain almost complete control over the Association. That is, the APA can become subjected to a type of political manipulation which will put the control of the association in the hands of a relatively small number of individuals. How is this possible?

Suppose that a group of about 240 people wished to gain considerable influence on the Council of Representatives to forward some program or policy beneficial to themselves but not necessarily beneficial to the Association as a whole. They could best carry out their program by electing as many members to the Council of Representatives as possible. This could be done by first forming a separate Division for themselves which would entitle them to three Representatives (Chairman, Secretary and one additional). Then, by joining a number of small Divisions and voting as a bloc, they could almost certainly elect one or more representatives favorable to their program in each of these

Divisions. The total number of Representatives which might be elected by a vigorous and aggressive minority of 240 individuals would thus seem to be limited only by the number of divisions existing and the willingness of these individuals to pay whatever Division fees may be involved.

Such a state of affairs probably would not occur, but the possibility that it could occur under the new By-Laws is a fundamental weakness.

Possible restrictive effect on interest and research. Under the present APA organization, a Member or Associate is privileged to submit a paper upon any topic that he may wish. In the suggested organization, programs of papers are to be arranged by the Division Program Committees (subject to coordination by the Convention Program Committee). Since the right is not specifically denied in the By-Laws, a Division could well make membership in that division a requirement for the submission of a paper to that Division's program.

Thus a child psychologist, for example, who has tested one of his theories on rats and might wish to read his paper on the program of Animal Behavior, could be required to join the Division of Animal Behavior and pay whatever dues are involved in order that he could read his paper. The ultimate effect of such action would be to restrict research interests and to discourage a psychologist from doing research in fields other than his Division or Divisions. Such restriction may not occur in practice, but the possibility that it could occur would indicate another weakness in the By-Laws.

III. Other Comments

There are many other questions about the proposed By-Laws which might be raised. Is an organization of between 3500 and 4000 members large enough to justify such an elaborate Divisional and Representative system? Is the organization large enough to support the proposed budget of $40,000.00 per year? For what purpose will the increased funds be spent? If reconstituted, should the organization start immediately with the proposed nineteen Divisions, or should it start with one General Division only, allowing other Divisions to form according to the procedures outlined in the proposed By-Laws? Is it desirable to give to groups which are not primarily psychological nor composed primarily of psychologists, special representation (Article IV, 10) on the legislative Council of a Psychological Association? There is not sufficient space for discussion of these and many other questions: the points which have been discussed above were selected because they seem to point most clearly to the necessity of careful consideration and to the undesirability of hasty action.

IV. Conclusion

Fundamentally, the present APA is a strong organization and it has well served the interests of the majority of its members. So far, I have not seen arguments or discussions which indicate that such a thorough revision of the organization as that suggested is either essential or desirable. Some modifications in the existing structure to meet the needs of special groups may be desirable and could be set up, but I believe that the APA should be the mainstay of any modified organization and that the Divisions or special groups should have only those powers which are specifically delegated or granted to them by the membership as a whole. The suggested By-Laws turn this around and make the Divisions primary, giving them all powers not specifically denied in the By-Laws. I do not believe that the interests of psychology and psychologists, as a whole, will best be served by the suggested reorganization. Some special interest groups may benefit, but it is a question as to whether the reorganization will unify psychology or disintegrate it. The suggested change in organization appears to be too fundamental to be made without considerable discussion by psychologists. Since it is no longer possible for any great number of psychologists to meet at conventions and express their views, it would seem most desirable that action on the proposed changes be postponed until such a time as public discussion is again possible.

A NOTE ON THE MEETING OF THE JOINT CONSTITUTIONAL COMMITTEE OF THE APA AND AAAP
FEBRUARY 26 and 27, 1944.

JOHN E. ANDERSON

The Joint Constitutional Committee of the APA and the AAAP met at Ohio State University in Columbus on February 26 and 27, 1944, to consider the results of the Survey of Opinion on the divisional organization of the reconstituted APA, together with such suggestions for the modification of the By-Laws as were submitted. Present were E. R. Hilgard, *Chairman*, J. E. Anderson, Alice I. Bryan, S. L. Pressey, and W. L. Valentine. The committee had available some 3,500 replies to some 6,000 blanks which had been mailed to psychologists. Of these replies, 3,210 had been tabulated.

The committee agreed upon the following charter divisions for the reconstituted APA, which, without the explanatory statements, will appear in Article VII, Section 12 of the By-Laws as revised by the Joint Committee. (Article III, Section 11, of the By-Laws as printed*).

1. *Division of General Psychology*
To include those who do not express a preference for another division.
2. *Division on the Teaching of Psychology*
To include those who are primarily teachers and have as a basic professional interest a desire to improve teaching materials, methods, and procedures.
3. *Division of Theoretical-Experimental Psychology*
To include those whose scientific research interests are related to the systematic, theoretical and methodological problems of psychology.
4. *The Psychometric Society—A Division of the APA.*
To include the present members of the society and others who are interested and who meet the requirements of the society.
5. *Division on Evaluation and Measurement*
To include those concerned with practical problems of evaluation, appraisal, and measurement.
6. *Division of Physiological and Comparative Psychology*
To include those interested in the methods and results of physiological and comparative investigations.
7. *Division of Childhood and Adolescence*
To include those interested in the field of human development.
8. *Division of Personality and Social Psychology*
To include those with theoretical and systematic interests in personality and social behavior.
9. *Society for the Psychological Study of Social Issues—A Division of the APA.*
To include present members of the society and others who are interested and who meet the requirements of the society.
10. *Division on Esthetics*
To include those whose interests are primarily in the psychology of music, art, literature, and drama.

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* By-Laws Appropriate for a Reconstituted APA. *Psychol. Bull.*, 1943, 40, 626–645.

11. *Division of Abnormal Psychology and Psychotherapy*

To include those interested in deviations from the normal and in treatment.

12. *Division of Clinical Psychology*

To include the present members of the clinical section of the AAAP, and others who are interested and who meet the requirements of the section.

13. *Division of Consulting Psychology*

To include the present members of the consulting section of the AAAP and others who are interested and who meet the requirements of the section.

14. *Division of Industrial and Business Psychology*

To include the present members of the business and industrial section of the AAAP and others who are interested and who meet section requirements.

15. *Division of Educational Psychology*

To include the present members of the educational section of the AAAP and others who are interested and who meet the requirements of the section.

16. *Division of School Psychologists*

To include practicing psychologists attached to a school or school system.

17. *Division of Personnel and Guidance Psychologists*

To include those whose primary interests are in selection, training, and guidance in schools, colleges, and guidance agencies.

18. *Division of Psychologists in Public Service*

To include psychologists employed in local, state, and federal governments.

19. *Division of Military Psychology*

To include the present members of the military section of the AAAP and others who are interested and who meet the requirements of the section.

As a result of the criticisms and suggestions sent in, some contradictions, duplications, lacks of parallelism, and other editorial defects in the By-Laws were met by rewriting, reorganization and renumbering without, however, essential changes in meaning. Detailed consideration was given the Board of Affiliates to which official objection had come from the Board of Governors of the AAAP, the New York State Association of Applied Psychology, and many individuals. Although the Board was eliminated, the principle of affiliation was retained. The responsibilities of the Executive Secretary and of the Central Office were clarified. The Article on Publications was rewritten, with a change from an Advisory Board to a Committee on Publications. The entire committee and board structure was examined in order to make more uniform the methods of selection, terms of office, and statements of responsibilities. The rewritten enabling article now includes a mechanism for putting the By-Laws into effect if adopted. It sets up a joint committee on reorganization to function during the transitional year, while the old societies continue as before.

The revised By-Laws, together with blanks for the advisory mail vote on their acceptance or rejection, and blanks for final divisional choices, will be distributed through society offices to the members of the psychological associations. The results of these ballots will be presented at the 1944 society meetings for such official action as the societies may wish to take.

PSYCHOLOGY AND THE WAR

Edited by

DONALD G. MARQUIS

CONTENTS

Organization and Research Activities, Psychological Research Unit No. 3, Army Air Forces, by *Staff PRU No. 3* 237

Office of Psychological Personnel, Report for the Year 1943, by *Donald G. Marquis* 246

A Study of 400 Psychologists Commissioned in the U. S. Naval Reserve, by *Commander C. M. Louttit* 253

Psychology and the War: Notes 258

War Department Conference on Planning of Civilian Personnel Testing

Proposed Book on the Psychological Adjustment of the Returning Soldier

Institute of Aviation Psychology

Notice

ORGANIZATION AND RESEARCH ACTIVITIES PSYCHOLOGICAL RESEARCH UNIT NO. 3 ARMY AIR FORCES

STAFF, PSYCHOLOGICAL RESEARCH UNIT NO. 3

*Santa Ana Army Air Base, Santa Ana, California**

This article is the third in a series describing the Aviation Psychology Program of the Army Air Forces. The first article in the series (2) presents a general outline of this program. The second article (3) deals with research activities at Psychological Research Unit No. 1, Nashville, Tennessee, and describes some of the operations involved in processing Aviation Students. The present report treats the history, organization, and research activities of Psychological Research Unit (PRU) No. 3, Santa Ana Army Air Base, Santa Ana, California.

I. Functions, History, and Personnel

The principal functions of PRU No. 3 are as follows:

(1) the administration of a prescribed battery of classification tests to candidates for aviation training for the purpose of providing aptitude ratings and

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* This article is based on the annual report for the Fiscal Year of 1943, prepared by the staff of Psychological Research Unit No. 3 and covers the period from the beginning of the unit to 30 June 1943. The materials were abstracted and edited in the Psychological Branch, Research Division, Office of the Air Surgeon, Headquarters, Army Air Forces.

recommendations concerning the aircrew classification of these individuals;

(2) the development of tests of intellectual functions and educational achievement; and

(3) the development of techniques and completion of special research projects for the Army Air Forces Western Flying Training Command.

The beginning of the unit dates from the appointment and assignment of Major (now Lt. Colonel) J. P. Guilford as Director on 3 March 1942. As of 30 June 1943, the personnel of the unit consisted of 19 officers and 102 enlisted men. All of the officers are graduates of accredited colleges or universities with either an undergraduate major in psychology or graduate work in this field. Approximately 75 percent hold advanced degrees in psychology. The majority of the enlisted men have a Bachelor's Degree with a major in the field of psychology, and approximately 20 percent hold advanced degrees. A roster of the names of the officers and enlisted men who have been on duty in the Aviation Psychology Program at PRU No. 3, prior to 30 June 1943 follows.

Officers who have been Assigned to Psychological Research Unit No. 3

Alchian, Armen A.
Brick, Jay R.
Brown, Clarence W.
Cook, Stuart W.
Crannell, Clarke W.
Grings, William W.
Guilford, Joy P.
Humphreys, Lloyd G.
Johnson, Albert P.
Kemp, Edward H.
Killian, Frank, Jr.
King, Joseph E., Jr.
King, Wilbur R.
Long, William F.
Lucio, William H.
Murphy, Robert E.
Perrish, Albert
Roff, Merrill F.
Russell, Roger W.
Stein, Seymour P.
Stevens, William C.
Walton, William E.
Warren, Neil D.

Enlisted Men who have been Assigned to Psychological Research Unit No. 3

Austin, Donald W.
Allenstein, Morton B.
Anderson, Clifford L.
Ax, Albert F.
Ball, Fred J.
Barenholtz, Joseph
Bath, John A.
Bean, Walter W.
Beck, John B.
Berne, Allan L.
Bessent, Trent E.
Bitzer, John A.
Bornemeier, Russell W.
Braden, Joseph D.
Brent, Allen R.
Brill, Robert S.
Brock, Robert L.
Brown, Gilbert C.
Bullock, Harrison
Burdman, Milton
Butler, John M.
Carlstrand, Robert W.
Carpenter, Lewis G.
Carver, William T.
Cass, William A., Jr.,
Cerf, Arthur Z.,
Christensen, Arden H.
Cole, Joseph C.
Coman, Edward F.
Coulson, Leo C. V.
Cowan, Warren J.
Crandell, Richard P.
Crumbaugh, James C.
Davis, Paul C.
Deigh, Maurice
Dexter, Richard O.
Diamond, Nathan M.
Dice, Robert F.
Dietsch, Robert W.
Druitt, William F.
Dudek, Frank J.
Duncan, Raymond E.
Ehmann, Gerhard E.
Eisenberg, Ralph M.
Elkin, Albert
Emeson, Walter A.
Etkin, Jacob G.
Fake, Clyde F.
Ferguson, James B.
Finston, Arthur H.
Foster, Lester I.
Fotos, George
Frank, Harry M.
Fruchter, Benjamin
Gallagher, Thomas P.
Garrett, William H.
Glass, Julius
Goettel, Philip O.
Goodman, Alan C.
Goodwin, Philip A.
Graham, Asbury M.
Graves, Mentor E.
Green, Lewis P.

Greenberg, Alexander
Hahn, Dale D.
Hales, Howard J.
Harsh, Joseph R.
Harter, Aubrey B.
Heller, Hyman
Hoban, Albert E.
Holmberg, David M. L.
Holmes, William W.
Hooper, Herbert E.
Howe, John W., Jr.
Hutchinson, Linn
Jensen, Alfred C.
Jerrells, Herbert E.
Jolley, Calvin B.
Kana, George
Katz, Barney
King, William C.
Kitterman, Robert R.
Knippel, William R.
Kounin, Jacob S.
Kravetz, Nathan
Krise, Edward M.
Lacke, Joseph P.
Lake, Richard A.
Lambert, Robert E.
Lamkin, Hibbard
LaVine, Harvey B.
Martin, Glenn C.
Mason, George E.
McClelland, William A.
McGrath, William
McCarthy, Harold E.
McPeek, George A., Jr.
Meiners, Eugene E.
Mendell, Ira A.
Mock Sanford J.
Mount, George E.
Michel, Norman Ellwood
Most, Milton L.
Munter, William H.
Myers, John L., Jr.
Neece, Robert W.
Newman, Emanuel H.
Neuman, Gerard G.
Oveross, Mardon J.
Owen, Frank E.
Owens, Forrest A.
Pearlstein, Leo
Peters, Donald B.
Pickman, Milton E.
Pierson, Robert M.
Porter, Robert B.
Potter, Eugene J.
Potter, Homer H.
Pruiett, Ralph E.
Rand, Morris J.
Ray, Esten W.
Richardson, Carroll H.
Richtig, Valentine L.
Riopelle, Arthur J.
Robinson, James O.
Rogosin, Hyman
Rokeach, Milton
Rose, Nicholas
Rose, Glenn Ivan
Rosenberg, Harry
Roth, Harold I.
Russell, Robert L.
Saxe, Carl H.
Scherer, Wallace B.
Schureman, Robert Y.
Shirley, Gerald H.
Shneidman, Edwin S.
Skahen, John R.
Slawson, Robert M.
Smith, Gerald F.
Smith, Harley B.
Smith, Mahlon B.
Smith, Robert M.
Smith, Thomas W.
Spelta, Victor F.
Sprecher, Harris A.
Stone, Leon N.
Summers, Oliver H.
Tarwater, Jesse W.
Utter, Robert F.
Vedder, Palmer W.
Verhusen, Ben L.
Vinson, David B.
Vinter, Robert D., Jr.
Vrettos, Nick N., Jr.
Wald, Malvin D.
Waldman, Marvin
Webb, John A.
Wheeler, William M.
Whittier, William C.
Weksler, Harold
Wiley, Charles W.
Wiley, Llewellyn N.
Willcox, Henry H., Jr.
Williamson, Dale C.
Wilson, Dale K.
Winkler, Rudolf
Worthington, Netter R.
Wolff, Joseph F.

II. ORGANIZATION AND PROCEDURES

The Unit is divided into five principal departments: (1) Administration and Supply, (2) Psychomotor Testing, (3) Coordinating, (4) Interviews, (5) Research and Test Construction. The division of these departments into sections may be described as follows. The Department of Administration and Supply includes the Director's office, the Adjutant's Office, and Supply. Under the Psychomotor Testing Department come the Test Administration Section, the Test Maintenance Section, and the Records and Statistics Section. The Coordinating Department covers the Scheduling Section, Group Testing Section, Scoring and Aggregate Weighting Section, Recording Section, Recommendations Section, and Records Section. The Department of Interviews includes the Interviewing Section, the Surgeon's Board Section, and the Analysis of Interview Reports and Evaluation Section. The Research and Test Construction Department includes Test Development, Statistics, and special Projects.

The procedures for processing candidates are the same at all Psychological Units. These have been presented in detail in the previous article, but may be described briefly here.

Each candidate for aviation training takes an initial screening test, the Aviation Cadet Qualifying Examination. If successful, he is tested later with the Psychological Classification Battery. This battery consists of 20 tests including a number of pencil and paper tests administered on the first day of testing, and several apparatus or psychomotor tests taken on the second testing day. Experimental tests may be administered following the appropriate classification tests. Recommendations for training as pilot, bombardier, navigator, or ground crew are made on the basis of aptitude scores, expressed preferences, and experience.

Among the data considered when recommendations for classification are decided, the candidates own statement of preferences has received much attention. Each candidate fills out a blank which provides opportunity for rating interest in the potential field of pilot, bombardier, navigator, and ground training on nine-point scales. In addition to a statement of preference for type of training, each candidate indicates on a form a preference waiver which consists of a statement of willingness to waive his preferences in the light of results on the psychological classification tests. These waivers are of four types ranging from "I want to be assigned to the type of aircrew training for which I show the greatest ability on the tests" to "I want to be assigned to the kind of aircrew training in which I am most interested *even* if the tests show that I would probably fail in that type of training." In addition to the aptitude scores, statements of preferences and preference waivers are taken into account in recommending each candidate for training.

In addition to obtaining a statement of preferences and preference waivers from each candidate, a number of applicants are interviewed. Several objectives have been foremost in connection with these interviews. These include the clarification of preference; the clarification of cases in which preference or aptitude scores are tied; the notification of candidates who are not qualified for the type of training they prefer; and the evaluation of motivation of those who state a high preference for some duty other than aircrew.

III. RESEARCH

In addition to the test construction and validation described in the following paragraphs, the personnel of PRU No. 3 have performed several job analyses, including one of the bombardier and one of the aerial gunner, and a number of statistical and normative studies. PRU No. 3 has also undertaken several special projects and contributed personnel to research detachments. A special contribution has been the procurement of early validation data. In many instances tests were given to classes in pre-flight school and reports were obtained directly from the flying schools. By means of criterion data obtained at the earliest possible date, it has been possible for PRU No. 3 to check the predictive value of various experimental tests several months sooner than was achieved for tests which were validated routinely at Headquarters, AAF Training Command.

The original assignment of research responsibility at PRU No. 3 was the area of intelligence, judgment, and scholastic or educational achievement. The following list of sub-areas, modified somewhat on the basis of early research findings, may be taken as defining the research field of PRU No. 3. Work on research problems in this area began soon after the unit was organized in March 1942. On the basis of an analysis of success and failure in flying training, a breakdown of this general area into a number of sub-areas had been made. These sub-areas are as follows: (1) information, (2) reasoning, (3) judgment, (4) foresight and planning, (5) memory, (6) reading comprehension, (7) mathematics, (8) physics, and (9) mechanics.

In seeking valid tests in the assigned area, several general working principles have been invoked by PRU No. 3. First, it has been the conviction that a systematic exploration and coverage of the sub-areas would prove more fruitful in the long run than the response to a series of isolated hunches, however brilliant. Secondly, the importance of obtaining and considering early validation data was stressed. Next, believing in the value of factor theory as a working hypothesis, factorial methods were employed in order to (1) test the provisional categories of the assigned areas; (2) discover the significant variables measured by tests devised in the sub-areas so that these variables could be capitalized; and (3) determine which tests in a given sub-area were most worth validating.

Specific hypotheses, working principles, and operational definitions of the sub-areas stated above are presented in the following discussions. Where systematic coverage of the sub-areas has been accomplished and data are available and can be released without violating security principles, specific description of tests and summaries of results are reported.

1. *Information.* The information area includes all areas of knowledge which might be expected to be predictive of success in pilot, bombardier, or navigator training, except mathematics and physics, which have been given independent status. Two specific fields are believed to be of major importance. One is the knowledge of aviation, flying, current aviation affairs, etc. The other area of primary importance is mechanical information. It was assumed that cadets with an experiential background of familiarity with machines, tools, automobiles, and automobile mechanics, etc., would have an advantage in aircrew training. The belief that these two specific fields would be of significance has been substantiated by the comparison of test results with success or failure in aircrew training. A test of information in several fields is included in the present classification battery.

2. *Judgment.* A considerable amount of research effort has been devoted to the development of judgment tests and judgment items both at PRU No. 3 and

in other units of the Aviation Psychology Program. A large proportion of this effort has been devoted to the development of items for the judgment section of the Aviation Cadet Qualifying Examination. On the basis of factor analyses of judgment tests, PRU No. 3 has suggested that, in the aviation context, judgment may not be a significant concept and can be broken down into more specific factors.

3. *Physics.* Several tests of physics have been developed which sample the terminology and general principles of physics with the exception of the fields of optics and acoustics. These tests appeared to be loaded primarily on the verbal-intellectual factor and, as in other tests heavily loaded with this factor, yielded validity coefficients ranging from zero to .15 for several samples of pilot cadets. No test in this area is employed in the classification battery.

4. *Reading Comprehension.* Several tests of reading comprehension have been developed and/or modified and tried out experimentally. Additional work is continuing on these tests at the present time. Tests of comprehension of technical material are in use at the present time.

5. *Mechanics.* Previous work both in the Aviation Psychology Program and in other agencies had indicated that the field of mechanical comprehension was one of the most important of all the intellectual areas for the selection of aviation trainees. A half dozen tests have been developed and several existing tests have been adapted to the use of the Aviation Psychology Program. Results obtained with these tests have substantiated the evidence mentioned above, and a Mechanical Comprehension Test has been included for some time in the classification test battery.

6. *Reasoning.* It was assumed that successful performance of any aircrew position would require, among other things, the ability to reason rapidly and accurately. The accumulation of validity data indicated clearly that neither numerical ability nor verbal ability as such had any validity for predicting success or failure in pilot training. That is, tests heavily weighted on the verbal-intellectual or numerical factors yielded consistently low validities against the criterion of graduation or elimination in pilot training. Consequently, the major emphasis in developing reasoning tests for predicting pilot success was placed on tests which were as free as possible from either verbal or numerical loadings. Since a great deal of psychological work had been done in the last thirty years on tests in this field, it was thought desirable to select the most appropriate of these for the initial study of this area. These tests were adapted to the needs of the Aviation Psychology Program. In all eight tests in this sub-area were developed or modified and validated on an experimental basis. The description of one of these tests follows.

The Figure Analogies Test is a new form of the familiar Figure Analogies Test which has appeared, among other places, in the American Council on Education tests. It is generally recognized as a non-verbal reasoning test and was heavily loaded on the non-verbal reasoning factor in the analysis of this battery of tests. This test was administered to 1200 unclassified candidates. Its validity was moderate for predicting success in pilot training. The test yielded satisfactory reliability on several large samples.

7. *Foresight and Planning.* One of the requirements of a successful aircrew member is the ability to plan a series of maneuvers or activites and to foresee and avoid possible difficulties. Eight tests were developed and validated in this relatively new area of test construction. Among these is a Sequence of Maneuvers test which was constructed in such a way as to include many of the problems confronting a student pilot when he is given a number of maneuvers

to practice and must plan to perform then in the most efficient order. In the test the candidate must take into account the altitude at which each maneuver must be performed and the amount of altitude lost or gained, and plan the arrangement in which he is to execute five maneuvers so as to have done the least amount of unnecessary climbing and diving. The reliability of this test is moderate; validity data are not yet available.

8. *Memory*. In an analysis of the reasons stated in Faculty Board proceedings for the elimination of 1,000 pilots in elementary pilot training (1), memory was reported to be of considerable importance as a source of failure. As a result of this analysis, ten tests of ability to retain detailed information were constructed. These tests, in part, represent a systematic variation of a number of the variables which are present in any memory test; e.g., method of presentation, time of exposure, type of material, time between exposure and recall, method of recall, material between exposure and recall, etc. An example of a test in this area may be described as follows. Plane-Name memory is a paired-associates, immediate-memory, pencil and paper test requiring the association of fictitious names with silhouettes of planes. A study page containing a number of planes and accompanied by a label showing their names is presented to the candidate for a brief period. Following this, the candidate is shown the planes and must select the correct names from a list of names. The split-half reliability coefficient of this test is moderately high. Memory tests, in general, have yielded low positive correlations with the criterion of graduation or elimination from pilot training.

9 *Mathematics*. Several tests in the field of mathematics have been developed or modified and employed for classification testing in the Aviation Psychology Program. As in the case of tests that are primarily loaded with the verbal-intellectual factor, it has been found that tests primarily loaded with the numerical factor are not valid in the pilot area, but are valid for predicting navigator success.

The first classification battery administered at PRU No. 3 contained a Mathematics Test which had been constructed at PRU No. 1. It was found possible to revise this test, and adjust it more specifically to the requirements of navigation training. Two transitional forms led to the development of the present classification Mathematics Test. For obvious reasons, this test cannot be described in detail, but it can be said that it measures mathematical competency with emphasis chiefly on algebraic manipulation.

Validation of scores on this test against performance in advanced navigation training for a variety of populations yielded consistently high validities. Since navigator classes have been characteristically drawn from candidates in the upper half of Aviation Cadets in navigation aptitude, the range of ability is restricted; if the whole range had been included, the validity coefficients would have been substantially higher.

Two test-retest reliability coefficients for different forms of this test based on intervals in both cases of three months or more were very high.

In addition to this test, several other mathematics tests have been employed for classification purposes. These tests were developed at PRU No. 3 and at other psychological units. These include a test of speed and accuracy of simple arithmetical computation and a test requiring speed and accuracy in estimating the approximate result of a sequence of arithmetical operations.

One of the most interesting tests developed by PRU No. 3 is a test known as Instrument Comprehension. This test consists of two parts which appear to measure speed and accuracy in selecting from a series of photographs the plane whose attitude in flight corresponds to that indicated on an accompanying group of dials and instruments. This test has yielded considerable validity on several large samples of candidates. The product moment correlation between scores on this test and the composite pilot aptitude score derived from the classification battery for a large sample was such that the addition of this test to the classification battery added significantly to the resulting multiple correlation. This test is included in the most recent classification battery.

In general, results obtained on tests in the area of intelligence, judgment, and scholastic achievement support the following generalizations: (1) Tests with heavy verbal-intellectual loadings are not valid for selecting pilots, but yield considerable validity in the prediction of navigator success. (2) Tests wholly or primarily numerical in content are not valid in the pilot field, but are valid for predicting navigator success. (3) Mechanical and informational tests are valid for the selection of pilot cadets.

Since the tentative areas of test construction were investigated by constructing a number of tests in each, the use of the factor techniques was suggested. Factor analysis has proven useful in several ways. Perhaps the most important use has been the empirical revision of the original *a priori* categories of test construction. Some tests based on the new factor categories have now been validated for pilot training, and several of them for navigation training. The results of factor methods have also served as guides in the selection of the few tests of a larger group showing most promise for immediate validation. Finally, with the accumulation of knowledge of factors and their validity, it has been possible to revise old tests and to construct new tests in line with that knowledge.

In addition to research in the field of intelligence, judgment, and educational achievement, the personnel of PRU No. 3 have developed, constructed, or modified for use in the Aviation Psychology Program one test in the field of emotion, temperament, and personality; five tests in the field of motor skills, two of which have been adopted for classification use; and three perceptual tests. Several of these tests have shown considerable correlation with the criteria.

In the new organization of the Aviation Psychology Program, the research function of PRU No. 3 will continue to be the development and construction of tests in the field of intelligence, judgment, and scholastic achievement. The staff that was responsible for research and test construction for the Aviation Cadet Qualifying Examination, formerly located in Washington, has been transferred to PRU No. 3 since the end of the period covered in this report. This move will facilitate closer coordination of research, test construction, and editorial work on the qualifying examination and classification tests. Also now located at the Santa Ana Army Air Base and coordinated with PRU No. 3 is a Psychological Test Film Unit. In addition to the research on classification problems, PRU No. 3 will undertake research on problems of training.

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THE OFFICE OF PSYCHOLOGICAL PERSONNEL REPORT FOR THE YEAR 1943

DONALD G. MARQUIS

In February 1942, the Office of Psychological Personnel was established under the auspices of the National Research Council. It was felt that the effective utilization of psychology and of psychologists in the war effort called for a central clearing house of information, and that the emergency demands of the war situation required a central executive agency which could promote more effective service by the profession as a whole.

The Office of Psychological Personnel has been housed in the building of the National Academy of Sciences at 2101 Constitution Avenue, Washington, D. C. Space was provided by the Division of Anthropology and Psychology of the National Research Council with the generous cooperation of the officers of the Council. During the first few months of its existence, the Office of Psychological Personnel was supported financially by emergency grants from the National Research Council and the American Psychological Association. The continuation of the Office was assured subsequently by regular appropriations from several of the national associations of psychologists, as detailed in the financial statement at the end of this report.

At the time of its establishment the Office of Psychological Personnel was charged with the promotion of "the maximum effective use of psychologists, irrespective of society membership, in the war effort." The absence of specific instructions and limitations has made possible a flexibility which was highly desirable during the period of development of the Office. As the nature and demands of the war situation have changed, the Office of Psychological Personnel has shifted some of its functions and has developed new ones. During the course of the year it has been possible to devote increasing attention to the problems of the profession in the post-war period. The Director of the Office of Psychological Personnel has reported regularly to the Emergency Committee in Psychology of the National Research Council and to the national associations of psychologists. Frequent and valuable advice has been secured from Dr. Leonard Carmichael, Chairman of the Division of Anthropology and Psychology of the National Research Council, and from the three official Consultants to the Office of Psychological Personnel: Dr. Robert M. Yerkes, member of the Emergency Committee in

Psychology; Dr. Willard C. Olson, Secretary of the American Psychological Association; and Dr. Alice I. Bryan, Executive Secretary of the American Association for Applied Psychology.

The effective utilization of psychologists seems to demand three general avenues of effort: the collection and filing for ready use of accurate and up-to-date information about psychologists; the discovery and promotion of job opportunities for psychologists; and the closer integration of the demand for and the supply of certain kinds of psychologists, by means of modification of present training programs.

To accomplish the *first objective* the Office of Psychological Personnel has established a coded file of approximately 6000 psychologists. One section of the file contains information about more than 2000 psychologists who are in military service. Another section of the file contains the registration forms submitted by psychologists who wish to be considered for change in employment. The number of names in this file has varied between 600 and 1100 during the year. No attempt is made to collect detailed information about the remaining group of psychologists. The files of the National Roster of Scientific and Specialized Personnel are utilized in those instances when a selection of names from the total group of psychologists is desired.

The *second objective*—the discovery and promotion of job opportunities for psychologists—involves a variety of activities. Knowledge of the existence of the Office of Psychological Personnel is often sufficient to elicit requests for aid from prospective employers. Through personal conferences a continuing effort is made to bring the service of the Office of Psychological Personnel to the attention of officials in the various branches of the armed services and in the federal war agencies. In special cases it has been possible to consult in the formulation of qualifications for new positions such that individuals with psychological training and experience will be eligible to apply. With the partial exception of the centralized war agencies, the creation of new job opportunities for psychologists will necessarily be dependent upon the initiative and foresight of individual psychologists who are in closest touch with the field of opportunity. The Office of Psychological Personnel should find its greatest usefulness in those areas where psychologists are not at present employed. When personnel is again available, a definite program should be instituted to inform such school systems, hospitals and state institutions, industries, and guidance centers of the possible services of psychologists.

The *third objective* is less tangible and requires special study before recommendations can be made. During the war period there has been a critical shortage of psychologists with special technological skills: statistics, test construction, psycho-physiological research methods, and methods of attitude and opinion measurement and analysis. The Army found an insufficient number with experience in personnel methods, interviewing, and occupational analysis, and therefore undertook to train such persons in the special schools of the Adjutant General's Department and in the Advanced Personnel Psychology course of the ASTP. A survey, described below, is being carried out by the Office of Psychological Personnel to provide a basis for estimating the relation between supply and demand in the various psychological fields after the war.

MILITARY SERVICE

Psychologists desiring to secure commissions for specialized work in the Army and Navy have been given information about opportunities and proper channels, and their qualifications have been brought to the attention of those in charge of officer procurement. In the course of the year direct commissioning was eliminated in the Army and drastically reduced in the Navy.

When any psychologist who is registered with the Office of Psychological Personnel is inducted, a statement of his training and experience is forwarded to the Office of the Adjutant General, the Bureau of Personnel and Training, USN, or the Research Division of the Office of the Surgeon, Army Air Forces. In instances of specially qualified persons, information may be sent to other offices such as the Surgeon General of the Army or Navy, the Office of Strategic Services, etc. This statement is used in effecting the proper classification of the individual in the Service. Whenever possible a follow-up is made to determine whether the assignment of the individual is such as to permit utilization of his professional qualifications. Several requests, involving hundreds of individuals, have been received from branches of the Armed Services for lists of qualified psychologists for reassignment to new duties. In order to keep up to date the information about psychologists in service, two questionnaires have been circulated during the year.

Army Specialized Training Program. In December 900 of the 1300 students in the Advanced Personnel Psychology Course completed their program and were assigned to Army units. Some time previously the Office of Psychological Personnel gave assistance to the Classification and Replacement Branch, AGD, in a survey of needs for psychologists in the Army. Between the inception of the AST program and its termination many features of the general Army situation had greatly changed. Anticipated needs for psychologists in induction and reception centers and in special training units had been eliminated by the rapid growth of the Army and by changes in Army procedure. Officer Candidate Schools had also been severely curtailed during this period. New needs, however, had developed along different lines, and the ASTP graduates received assignments to personnel duties in various units of the Ground Forces, the Service Forces, and the Air Forces.

Certain instances of assignments which went wrong for one reason or another have been discovered and brought to the attention of the AGD with satisfactory outcome. A systematic follow-up survey was also made with the cooperation of the Course directors about a month following graduation. In all these activities the Office of Psychological Personnel has worked in close cooperation with the military officials, and the experience has made it clear that the peculiar advantages of a civilian office can effectively supplement the military procedures.

FEDERAL AGENCIES

Continuing contact with representatives of government war agencies is necessary to keep up with the varied and rapidly changing needs for psychological personnel. The Director has consulted in these matters with the following:

Civil Service Commission
Civilian Personnel Division, Office of the Secretary of War
Division of Program Surveys, Department of Agriculture
Foreign Broadcast Intelligence Service, FCC
National Research Council
Office of Price Administration
Office of Scientific Research and Development
Office of Strategic Services
Office of War Information
Veterans Administration
Vocational Rehabilitation Division, FSA
War Manpower Commission, FSA
War Production Board

JOB REFERRAL SERVICE

During the year 215 requests were received from prospective employers of psychologists, not including the military services. Table I presents a breakdown of these requests and the outcome as determined by a follow-up inquiry.

The acute shortage of well qualified and experienced psychologists is reflected in the fact that no placement was made in 118 out of 215 prospective openings. It is normally to be expected that a certain number of jobs will fall through after preliminary inquiries are made, but this large proportion reflects the general instability of the employment situation as well as the scarcity of good applicants.

The analysis indicates that placement was made from Office of Psychological Personnel referrals in 54 percent of the positions in which any placement was made. The referrals were apparently most effective for positions in federal agencies and war research projects—reflecting probably a better understanding of the job qualifications based on personal conferences in Washington with the prospective employer.

TABLE I

ANALYSIS OF JOB REQUESTS

Employer	Total requests	For information or no placement made	Placement made	Placement from OPP referrals
Colleges, universities	67	31	36	15
Industries, consulting organizations	12	6	6	4
Schools	4	0	4	1
Clinics, guidance centers	20	12	8	2
State hospitals, other institutions	14	8	6	3
Public personnel agencies	12	9	3	2
Federal war agencies	46	34	12	7
Other federal agencies	13	9	4	3
War research projects (OSRD, NDRC, NRC, CMR)	27	9	18	15
Totals	215	118	97	52

EMPLOYMENT SURVEY

During the second half of the year it became apparent that the services of the Office could be increased in effectiveness by a systematic survey of the employment of psychologists. Other groups interested in planning for the profession indicated that they could make good use of the results of such a survey. The Council of the APA discussed the need for a survey of the nature of post-war employment problems; the APA Committee on Graduate and Professional Training needed factual data on the functions psychologists are called upon to perform; the Emergency Committee discussed the need for a directory of the war activities of psychologists; and the Survey and Planning Subcommittee recommended other items of value. To avoid the burden and expense of several independent circularizations, the Office of Psychological Personnel undertook to prepare and distribute a single questionnaire which could fulfill the several objectives.

This questionnaire was mailed in December to a list of 6000 psychologists who had at least one year of graduate training. Of these, 4000 are members of the APA or AAAP; the other names were secured from affiliated organizations and from the files of the Office of Psychological Personnel and the National Roster of Scientific and Specialized Personnel. The returned questionnaires will be coded and punched on I.B.M. cards for machine sorting. The 1300 graduates of the ASTP course in Psychology were also circularized to determine their background in psychology and their plans for further training or for employment in the field after the war.

INFORMATION SERVICES

One of the inevitable and one of the most useful consequences of the establishment of an executive professional office is the centralization of informational services. As the Office of Psychological Personnel has become known it has received inquiries from a variety of sources concerning many items: references and bibliographies, tests, the names of experts in certain fields, opportunities for graduate training, procedures for certain professional activities, etc. Many of the inquiries are referred to individuals better qualified to deal with them. The Director comes to learn what is going on in different circles through his personal contacts and his ex officio membership on Committees of the various psychological organizations, and is thereby enabled to suggest methods of integration and elimination of duplication, and to refer ideas from various sources to persons and groups capable of carrying them out.

The Director serves as Editor of the monthly section on "Psychology and the War" of the *Psychological Bulletin*, which is designed to present a current picture of the war-time activities of psychologists. Most of the articles and notes are directly solicited, and two articles dealing with Rehabilitation activities and with Social Psychologists in War Agencies have been prepared specially. Talks by the Director have been presented before several groups which were interested in the role of psychology in the war effort.

STAFF OF THE OFFICE

The first Director was Steuart Henderson Britt, George Washington University, who resigned in May, 1943, to accept a commission as Lieutenant in the USNR. In July, Donald G. Marquis, Yale University, was appointed Director on a part time basis. Miss Iris Stevenson, Assistant to the Director, resigned in July to accept appointment as Ensign in the WAVES, and was succeeded by Mrs. Jane D. Morgan.

FINANCIAL STATEMENT AND BUDGET

On the following page there will be found a financial statement of the Office of Psychological Personnel, which shows the Receipts and Expenditures of the Office for the year 1943, together with the Budget under which the Office of Psychological Personnel is operating during the year 1944.

OFFICE OF PSYCHOLOGICAL PERSONNEL

FINANCIAL STATEMENT—1943

RECEIPTS

Balance on hand	$ 437.21
American Psychological Association	10,000.00
American Association for Applied Psychology	1,000.00
Society of Experimental Psychologists	100.00
Society for the Psychological Study of Social Issues	50.00
	$11,587.21

EXPENSES

Salaries (Director, Assistant, Secretarial and Clerical help)	$ 7,233.56
Office expense (postage, mimeographing, printing, telephone and telegraph, supplies)	1,405.92*
Travel	1,289.96
Reprints	205.73
Office Furniture and Equipment	315.50
	$10,450.67
Balance†	1,136.54

[*] Approximately $1,000 of this item is for postage and printing in connection with the Employment Survey conducted in December, 1943.

[†] Refund was made to the American Psychological Association $ 1,033.22
and to the American Association for Applied Psychology 103.32

BUDGET FOR 1944

Estimated Receipts

American Psychological Association	$10,000.00
American Association for Applied Psychology	1,000.00
	$11,000.00

Estimated Expenses

Salaries		$ 6,630.00
Director	$ 800.00	
Assistant	2,200.00	
Stenographers (2)	3,120.00	
Occasional clerical	510.00	
Office expense		400.00
Travel		2,500.00
Reprints		100.00
Miscellaneous		370.00
		$10,000.00
Balance		1,000.00

A STUDY OF 400 PSYCHOLOGISTS COMMISSIONED IN THE U. S. NAVAL RESERVE

C. M. LOUTTIT, COMMANDER, USNR
Bureau of Naval Personnel

There has been abundant evidence that psychologists have found a wide usefulness in war activities of all sorts. This is as true in the Navy as it is in Army or civilian activities. In previous papers, Bremner (1) Jenkins (2) and Louttit (3, 4), have written concerning psychologists commissioned for duty in the Navy. In the earliest of these papers published in 1941, Louttit described the type of psychological work then in prospect and concluded by saying "at the present time the billets available approximate 50 and there is encouraging progress in filling these." In 1943 the same author summarized the duties of 148 officers then on duty. The data of this second paper were recognized as being incomplete, but were the best available secured by inquiry from the officers having charge of different types of programs.

With the successful operation of an Officers Classification Section in the Bureau of Naval Personnel, it became possible to tabulate the names of officers with special qualifications by use of IBM equipment. Through the generous cooperation of Lt. Comdr. J. C. O'Brien, a list of 329 names of persons having a master's or doctor's degree with a major in psychology was secured. There were added to this list 86 additional names of officers working in special psychological programs which for some reason or other had not been tabulated by the machines. The total group numbered 415. It is to be noted that the only criterion used to define psychologist was the possession of a master's or doctor's degree. As will be seen later, there were included a considerable number of persons who while they had received graduate degrees in this field were either known not to be professional psychologists or had failed to become members of the national associations. However, for the purpose of this study it was decided to analyze the total group. Separate checks were made on the rank, reserve classification and present duties and duty station as of January 1, 1944.

Civilian occupation. Unfortunately, methods of determining the specific civilian occupations of all of these people were not reasonably available. However, a tabulation from the civilian occupation codes of the 329 officers listed by the Classification Section indicated the following major groupings: psychology, 182; education (including teaching other than psychology) 97; personnel work, 17; and miscellaneous (business, science, engineering, etc.), 33. Thus 60 percent of this group of officers were engaged in psychological activities in civilian life.

Association membership. As another possible indication of the proportion who would, without doubt, be considered professional psychologists, the names were checked against the membership lists of the American Psychological Association and the American Association for Applied Psychology. Table I shows the distribution of membership by association and class. The data of this table are not to be taken as indicating that those who were not listed as members were not professional psychologists. In accidentally determined cases individuals known to have been engaged in psychological activities in civil life were not members of associations. In many cases the civilian profession was in education or some similarly related field. For our purposes it seemed to be unwise to attempt in each case to make a subjective decision as to whether or not that individual should be included. It should, however, be of interest to the officers of the associations that only 40 percent of these people having graduate degrees in the field were members of professional societies.

TABLE I

ASSOCIATION MEMBERSHIPS

APA, Member	5
APA, Associate	115
AAAP, Fellow	1
AAAP, Associate	1
APA, Member; AAAP, Fellow	12
APA, Associate; AAAP, Fellow	15
APA, Member; AAAP, Associate	1
APA, Associate; AAAP, Associate	12
Total	162
Non-members	253
	415

Reserve class. Officers in the naval reserve are assigned to certain classes which roughly indicate the nature of special activities in which they might be engaged. Most of these classes are considered line officers as distinct from staff officers although their specialized duties very probably would never involve line functions in the technical sense. In Table II are shown the several reserve classes in which this group of psychologists have been commissioned. In the case of the ordnance, engineering and certain aviation groups as well as the staff classes, supply and chaplains, it seems reasonable that most of the individuals had probably not engaged in psychological activities in civil life in spite of their graduate degree. However, these groups represent a relatively small proportion of the total.

Table II also gives information concerning the use of women psychologists. Of the total 415 individuals, 47 are in Class W-V(S) which is the symbol for the women's reserve. As can be determined from Table

III a majority of these women have duties either in psychological or in closely related educational or personnel activities.

Rank. As of January 1, 1944 psychologists in the group under consideration held commissions from Ensign to Commander. The majority of them were of course in the lower ranks although the modal point with 132 were Lieutenants (junior grade). It is interesting also to note from this table that with increasing rank there was a higher proportion holding the Ph.D degree. These percentages may be summarized as follows: Ensign, 24; Lieutenant (jg), 30; Lieutenant, 53; Lieutenant Commander, 75; Commander, 100.

TABLE II
NAVAL RESERVE CLASS AND RANKS

Class	Comdr.		Lt. Comdr.		Lt.		Lt. (jg)		Ens.		Total
	PhD	MA	PhD	MA	PhD	MA	PhD	MA	PhD	MA	
D-VS, Deck-specialist	3		7	1	29	25	11	54	7	22	159
D-VG, Deck-general						2		3	1	12	18
H-VS, Hospital-specialists			6	2	27	12	20	12	12	16	107
A-VS, Aviation-specialists			1	1	6	16	5	13	3	3	48
A-VN, Naval aviators						2	1	1			4
A-VT, Civilian pilot					1						1
C-VS, Communication								2	1	5	8
C-VX, Communications	1		1		2		3				7
I-VS, Intelligence				1		1		3		1	6
SC-VG, Supply, general						1				2	3
SC-VS, Supply, specialist										1	1
CH-CS, Chaplain					1			1			2
E-VG, Engineering								1			1
E-VRS, Electronic engineer						1					1
O-VS, Ordnance						1		1			2
W-VS, Waves					2	2	3	10	2	23	42
W-VSH, Waves, hospital					1		1			3	5
Totals	4		15	5	69	63	44	101	26	88	415
Totals by rank	4		20		132		145		114		

Duties. Probably the question of greatest interest is the duties being performed by psychologists. It is impossible from records available in the Bureau to determine the exact duties of an officer. The questionnaires from which the IBM cards were made contained the officer's description of his duties which were then reduced to a code symbol. From records in the Bureau present duty station was checked. From these two avenues it has been possible to condense in a reasonably accurate and satisfying picture the duties shown in Table III. In this table there are 4 major categories. The first, psychology, includes all those officers definitely known to be doing specific psychological activities either in connection with selection and classification of personnel, in connection with aviation psychology, or in cooperation with psychiatrists in the initial medical examination of recruits or in Naval hospitals. The second category, education and personnel, include officers having duties on the staffs of schools, development of training aids, in officer procurement, or in connection with personnel pools where the duties do not necessarily involve technical psychological procedures. The third category, operational, includes officers on duty at sea, overseas bases or aviation units where their duties almost entirely are naval operational in nature and do not involve psychology at all. The fourth category, miscellaneous, includes a variety of sub-categories which are self-ex-

TABLE III

DUTY STATIONS BY SEX, MEMBERSHIP AND DEGREE

Duty and/or station	Men				Women				Total
	Member		Non-Member		Member		Non-Member		
	PhD	MA	PhD	MA	PhD	MA	PhD	MA	
Psychology									175
Bureau Naval Personnel	10	3	7	6	1		1		28
Training Station Selection	3	4	4	7	1	1		3	23
Training Station Psychiatric Unit	17	3	4	3					27
Psychiatric billets	7	1	2	1	2	1		2	16
Aviation psychology	32	19	5	12				2	70
Director Naval Communications	6	1							7
Miscellaneous	1		1	2					4
Education and Personnel									97
Training stations		2	3	3				4	12
Schools	4	1	1	10			1	2	19
V-12 Units	2	1	3	5					11
Aviation Training	8	1	2	19				1	31
Officer procurement	3		2	2				7	14
Miscellaneous	2		1	5	2				10
Operational									91
Ships	2	1	1	22					26
Aviation	1	1	1	4					7
Armed guard				9					9
Aviation administrative	5	3	1	18				4	31
Miscellaneous shore	1		2	15					18
Miscellaneous									50
Communications		1		8		1		3	13
Supply				4					4
Ordnance				2					2
Intelligence		1		6					7
Chaplain			1	1					2
Miscellaneous	2	1		11			1	7	22
Missing in action			1	1					2
Totals	106	44	42	176	6	3	3	35	415

planatory and in no case do they involve work of a psychological nature.

It is of particular interest to call attention to the operational group including 89 officers, 15 of whom have the Ph.D. degree who are engaged in straight naval duties. While we have no specific evidence, the general impression from studying the data suggests that these are mostly younger men. To some these duties may suggest a waste of specially trained man power but there is good reason to believe that the very characteristics which would make them potentially useful as psychologists also make them of high value in more strictly military types of duty.

Summary. This study of 415 naval reserve officers holding the M.A. or Ph.D. degree in psychology gives the most complete account yet available of the use of psychologists by the Navy. It indicates that in a majority of cases professional training is being utilized directly or in closely related fields; in some cases the graduate work in psychology was apparently incidental and the man is engaged in naval duties in line with his primary occupation; in most of the remaining cases while the naval duties do not utilize psychological training, they are important billets frequently in combat service.

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3. LOUTTIT, C. M. Psychological work in the U. S. Navy. *J. consult. Psychol.*, 1941, 5, 225–227.
4. LOUTTIT, C. M. Psychologists in the Navy. *Psychol. Bull.*, 1943, **40**, 375–376.

PSYCHOLOGY AND THE WAR: NOTES

War Department Conference on Planning of Civilian Personnel Testing. Attended by 60 representatives of the various military and public agencies concerned with civilian personnel problems, a conference on planning for testing of civilian employees was held in Washington, D. C., on December 14, 15 and 16 by the Civilian Personnel Division of the Office of the Secretary of War. The conference chairman was Douglas H. Fryer, Chief of the Personnel Research Branch, and the conference manager was Watson O'D. Pierce, Test Construction Advisor, both from Civilian Personnel Division.

By an exchange of information between technical testing personnel in civilian personnel units of the War Department and similar workers in other Government agencies, the meeting had the following objectives as the basis for planning an efficient and comprehensive Civilian Personnel testing program.

1. To compile a list of aptitude, achievement, personality and morale tests or rating scales which have been constructed and operated in various War Department units, or are made available to the War Department by other Government agencies. These measures are to be studied in relation to the standardizations presently available and the probable relationships of present norms to the practical testing situations in training, employee relations and placement.
2. To survey the areas in which tests or measures are immediately required, and to assemble information of possible test construction allocations which could develop new or adapted tests to fulfill these needs.
3. To assemble qualifications and lists of available personnel or personnel engaged in the following activities:
    a. Test administration and interpretation for purposes of training, placement and employee relations.
    b. Test construction and research in the development of tests and rating scales.

On the basis of the discussion during the first two days of the conference, four special planning groups prepared a written summary and set of recommendations on the following topics:

1. Test materials and facilities in civilian personnel units of the War Department (Edward E. Cureton, Chairman)
2. Test materials and facilities available for use in civilian personnel programs in the War Department (Beatrice Dvorak, Chairman)
3. Administration of testing services (Frederick Kuder, Chairman)
4. Qualifications of testing personnel (Donald G. Marquis, Chairman)

It is expected that the report of the conference will be used as a means of developing plans to be submitted to the Secretary of War's Council on Civilian Personnel for establishing the appropriate use of testing and its proper relationship within the civilian personnel program of the War Department.

Walter V. Bingham, Chief Psychologist, Classification and Replacement Branch, AGO, was toastmaster at a luncheon which concluded the third day of the conference. William H. Kushnick, Director of Civilian Personnel and Training of the War Department, spoke on "Portfolio for Measurement in Personnel Management." George Shipman, Chief of the Management and

Organization Section, Bureau of the Budget, discussed "The Management Implications of Personnel Testing in the Government Service."

Proposed Book on the Psychological Adjustment of the Returning Soldier. A manual for the psychological service of returned service men is being prepared under the editorship of Dr. Irvin L. Child of Yale University, who has been appointed editor by the Subcommittee on the Textbook of Military Psychology, acting with the authorization of the National Research Council's Emergency Committee in Psychology. This book is intended to become a companion volume to *Psychology for the Fighting Man,* similar to it in form and in manner of distribution, although somewhat shorter. Miss Marjorie Van de Water of Science Service will be associated with Dr. Child in the editorial task, and they are securing the services of a group of collaborators. The volume is expected to contain materials on the psychological import of shifting from military to civilian life, on the veteran's vocational, family and civic adjustment, and on adjustment to service-incurred disabilities.

Institute of Aviation Psychology. Facilities for research in the selection, training, and maintenance of pilots have recently been expanded by the organization of an Institute of Aviation Psychology at The University of Tennessee. The Institute is supported with funds allotted by the Civil Aeronautics Administration and the State of Tennessee Bureau of Aeronautics. It will be administered by the Committee on Selection and Training of Aircraft Pilots of the National Research Council in cooperation with a special Project Committee of The University of Tennessee and the Division of Research, Civil Aeronautics Administration.

The establishment of the Institute represents the fulfillment of plans formulated by Dean R. Brimhall, Director of Research, Civil Aeronautics Administration, in consultation with the National Research Council Committee on Selection and Training of Aircraft Pilots under the Chairmanship of Morris S. Viteles, University of Pennsylvania.

The Institute of Aviation Psychology, the first in the United States—and possibly in the world—represents a major development in a program of research on the human factor in aviation initiated in 1939 by the Civil Aeronautics Administration in setting up its plans for training a large number of civilian pilots.

At the time of Pearl Harbor, there had already been accumulated in this research program a mass of data and numerous practical methods which were immediately made available to the Armed Services for use in building up a competent force of aviation personnel. During the past three years, the emphasis in research has been on the selection and training of military pilots. The establishment of an Institute of Aviation Psychology at a State University, supported by state as well as federal funds, represents a method of assuring the continuation of such research in the Post-War era with a renewed emphasis upon the problems of civilian flying. Through such an Institute, and others like it at other universities, steps can be taken to avoid the unfortunate cessation of basic and practical research which occurred at the close of the last war.

Special attention is to be given to problems of training and to developing methods of instruction and training aids which can help to reduce failures among student pilots and to decrease the incidence of accidents following the completion of training. The United States has pioneered in such research in work done at various universities, with funds made available by the Civil Aeronautics Administration, under the general supervision of an Executive Subcommittee of the National Research Council Committee on Selection and Training of Aircraft Pilots consisting of: Charles W. Bray, Dean R. Brimhall, Cdr. Daniel J. Brimm, Leonard Carmichael, Lt. Cdr. Jack W. Dunlap, Lt. Col. John C. Flanagan, Harry M. Johnson, Walter R. Miles, G. R. Wendt, and Morris S. Viteles, Chairman.

In the proposed studies at The University of Tennessee, there will be available findings and apparatus which make possible an accelerated program of research and training. Among these is an airborne model of a magnetic wire recorder which allows the recording of instruction given in the air and an analysis of comments made by instructors doing check flights. Research planes are also equipped with a motion photographic installation recording systematically the movements of airplane controls and of the attitudes of the plane during flight—whether it slips or skids, loses or gains altitude, etc. "Patter Books" or standard instruction guides, flight inventories, and many other similar tools will be used in the integrated program of research on training at the Institute of Aviation Psychology.

Student pilots will be drawn from civilian residents of Knoxville and its vicinity who will be trained on a University airport. It is anticipated that many of these will be high school students below age for the Services. Others will be men rejected for physical reasons by the Armed Services, who will provide an opportunity for the exact experimental determination of what constitutes a physical handicap to flying. Student pilots will be awarded "fellowships" for training. They will be required, however, to take this training under conditions which will make it possible to determine the effect of various methods of training upon the acquisition of flying skill.

Research projects will be planned jointly by Robert Y. Walker, formerly of the Ohio State University, Director of the Institute, the Project Committee of the University of Tennessee, including E. S. Fabian, K. L. Hertel, P.B. Stockdale, and E. A. Waters, and the Executive Subcommittee of the Committee on Selection and Training of Aircraft Pilots in consultation with the Division of Research of the Civil Aeronautics Administration. The Institute staff will include R. E. Dunford and S. E. Torsten Lund, of the University of Tennessee, as well as others drawn from current projects of the Committee on Selection and Training of Aircraft Pilots. It is anticipated, however, that work will continue on a number of projects centered at other universities.

Notice. The Office of Psychological Personnel has received urgent inquiries from several government agencies engaged in essential war work for men who have demonstrated ability to plan, carry out, and report research studies in any of the various fields of psychology. They must not be subject to call by Selective Service, i.e., they must be in Class 4F or over 38 years of age. Salaries available are $3800 and $4600 plus overtime. Persons interested should notify the Director of the Office of Psychological Personnel, 2101 Constitution Avenue, Washington 25, D. C.

BOOK REVIEWS

MEIER, N. C. Military psychology. New York: Harper, 1943. Pp. xx+395.

To the small list of books on military psychology already on our bookshelves another volume was added in the fall of 1943. Professor N. C. Meier, the author of this newest book, is a veteran of World War I. Over the years since 1919 he has retained his interests in things military. He has put down his current beliefs in this book and in a recent journal article.[1] Not content to present the data of his book in a "take it or leave it" style, Meier has made a serious attempt to put himself in the position of the prospective private or officer and to see what psychology has to offer for every situation which might arise.

The book opens with a foreword by Lieutenant General Ben Lear which by implication assures the reader that the military facts of the volume are essentially correct. After the author's preface come the eight major chapters of text. These latter in turn are followed by eight parallel chapters of applications and problems. These problems are well considered and could readily serve as the meat for many discussion sessions of the sort fostered by the English universities for the British soldiers but so far relatively uncommon among the American forces. The book closes with four appendices which deal with such topics as "suggestions for handling interviews," "requirements for miscellaneous services," "a rating scale for candidates for officer training schools," and "proposed additional methods for selection of combat officers." There is a glossary of terms and an index.

Meier's first chapter on "why men fight; group conflict" is excellent propaganda for democracy, more appealing perhaps to the naïve than to the sophisticate. The latter may well lift eyebrows at the following quotation and wonder if Meier did not have tongue in cheek while writing it.

> In democratic nations which permit freedom of expression, propaganda is freely used—but with a significant difference. Any person, any group, any corporation, even the government, *may* indulge in an effort to arouse interest in and support for its point of view. This is taken for granted. But the government, as a matter of state policy, carefully refrains from so doing. Those citizens who are the temporary administrators in power prefer to execute the people's will. They permit others to debate the issues; they expect Congress likewise to sense the wishes of the people and, when known, to enact measures to put them into effect (17).

There is a footnote after the words "so doing" which reads "Statement to the writer by Assistant Secretary of State A. A. Berle, Jr."

Chapters II and III deal with "psychological aspects of warfare" and "preparation of combat morale" respectively. These topics have been carefully considered and are in line with current psychological thought. At the end of these and other chapters are excellent bibliographies. Following each German reference is a brief abstract furnished by the Committee for National Morale.

The next two chapters concern the "adaptation of skills to military needs" and "learning military skills." These discussions are good and possess added interest through the presentation of five of the book's six illustrations. (More graphs and tables judiciously scattered through the volume would in all probability have added considerably to the layman's enjoyment of the book.) As was to have been expected, Meier seems more at home in discussing visual data than he does in considering facts about the other senses. His section on camouflage is particularly interesting.

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[1] Meier, Norman C. The introductory course and military psychology. *Psychol. Bull.*, 1943, 40, 787–790.

The last three chapters go over into the social and abnormal fields. The style becomes more fatherly and so possibly less interesting; yet the preachings are all decidedly worth-while. Here, and elsewhere in the book, certain of the words which the author desires to have emphasized are italicized. Normally, such a procedure makes for more intelligible reading. However, Harper and Brothers, publishers, have, for some reason or other, altered the slant of the letters of these italicized words so slightly from the vertical that the reviewer—and others with whom he discussed the issue—found that considerable eye disturbance rather than the desired reading-ease resulted.

Meier's *Military psychology* is similar, in some ways, both to *Psychology for the fighting man*[2] and to *The psychology of military leadership*.[3] Like the former it presents a large number of psychological facts to the prospective and present-day soldier. Like the latter it speaks with military authority and with an air of giving fatherly advice. Meier's book does not present so many psychological data as does *Psychology for the fighting man*, and is weakest in the field of perception, which is just the area in which the latter is strongest. As it overlaps but little with this book and not too greatly with *The psychology of military leadership*, all three books should find places in the libraries of those dealing with problems of military psychology.

The style of *Military psychology* makes for harder reading than does that of the National Research Council's offering. Partly for this reason and partly because its data are less spectacular it seems suited more to the introspective sort of private or officer who is willing and anxious to spend much time mulling over the text and questions. Notwithstanding a statement to the contrary in General Lear's foreword, the book is not adapted to do duty as a high school text. The psychologically untrained soldier will not read Meier's chapters with the same thrill that he will the Council's—with the growing belief that here are numerous startling facts he can readily put to work. He will feel that many if not most of the observations are closer to common sense than to science. Yet he will be amply repaid for the time he spends on the book's approximately 400 pages.

PAUL R. FARNSWORTH.

Stanford University.

CHILD, I. L. Italian or American? The second generation in conflict. New Haven: Yale University Press, 1943. Pp. 208.

Choosing New Haven, where approximately 17% of the population are second generation Italians, Child has studied the resolution of the second generation conflict. It is unfortunate that so small a group of actual informants could be secured: three life histories, 12 informal interviews, and 53 standardized interviews. The inadequacy of this sampling is partially offset by the author's general acquaintance in the Italian community.

In any study of this type the method of interpreting data is the crucial point in establishing the validity of conclusions. The use of psychological principles largely evolved from animal learning and conditioning seems strange here where the basic problems are emotional and motivational. Reinforcement, extinction, avoidance learning, generalization and differentiation are the primary psychological principles considered. Nor does a comparison with the Hovland-Sears "conflict board" seem sufficient for interpretation of the resolution of the second generation conflict. The problems of this generation must of necessity be far more than the "double approach-avoidance conflict of every day life."

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[2] National Research Council. Psychology for the fighting man. Washington: *The Infantry Journal*, 1943.

[3] Pennington, L. A., Hough, R. B., & Case, H. W. The psychology of military leadership. New York: Prentice-Hall, 1943.

In spite of these weaknesses psychologists will find much of interest in the three types of reaction which Child concludes represent the resolution of the second generation conflict. The *rebel reaction* arises from the choice of one of the two incompatible goals, in this case the American. "Yankee" rejection constitutes a strong barrier, and resultant frustrations arouse reactions of aggression toward the Italian group, projection of one's frustrated desires on one's children, and an occasional exaggerated emphasis on being American. The *in-group reaction* arises from the alternative choice of accepting the Italian goal. The barriers erected by the American group retain their character as barriers, with the individual striving for the dominance in American society of the Italian group with which he has identified himself. The *apathetic reaction* is the least satisfactory of Dr. Child's conclusions. It is described as a retreat from the conflict situation in the avoidance of both goals, the individual "changing his memory and his perception of the world around him in such a way that the arousal of tendencies to seek affiliation with either the Italian or the American group is reduced to a minimum." It seems to the reviewer that the apathetic reaction arises not from the desire to go toward either of two incompatible goals, but from the lack of psychological identification with either the parental or the environmental pattern. Being largely unconscious, this reaction is least accessible with interview techniques.

In his discussion of the rebel group Child points out that half display this reaction in relation to the parental family; and in the in-group "the reaction tends to be associated with an especially strong loyalty to the family." Yet the dynamics of the family situation are largely disregarded in making interpretations. In the briefly mentioned three life histories the importance of the parental attitude is clearly seen. The whole study would have been greatly strengthened by a more detailed consideration of the dynamics of this situation, which perhaps could have best been done through the inclusion of more life histories and a detailed consideration of them. For it is from the life history of the individual that the real sources and directions of his conscious and unconscious solutions of the second generation conflict can be perceived.

DOROTHY TILDEN SPOERL.

American International College.

JENNINGS, H. H. Leadership and isolation. New York: Longmans, Green, 1943. Pp. xv+240.

Dr. Jennings has collaborated for over a decade with J. L. Moreno in the development and use of a "sociometric test." As first devised this consisted merely of listing, in order of choice, the five members of a group with whom one would like to live or work. The author's present investigation among the 450 inmates of the New York State Training School for Girls represents, as Gardner Murphy states in his Foreword, "the coming of age of a number of the sociometric procedures." In this study the subjects were free to express an unlimited number of rejections, as well as of positive choices, and careful personality analyses were made of the popular and unpopular girls.

The confidence of the subjects had been gained through their participation in previous sociometric studies. Their cooperation was further elicited by discussing the investigation with them and giving them some influence in shaping its course. The main request made of each girl was that she list the members of the institution with whom she would like to live and/or work. The reliability of such choices has been found in other studies to be high (always over .90). Eight months later the investigation was repeated. The subjects were mostly sexual delinquents between 12 and 18 years of age; they were all non-psychotic and of normal intelligence.

The girls averaged eight positive choices and four rejections. Of a girl's positive choices, approximately 35% were reciprocated; of the rejections, only about 20% were reciprocated. The author feels that the low degree of positive mutuality is not necessarily indicative of social maladjustments. In many instances the individual likes to have another person around because he is jolly or resourceful, without caring particularly whether or not the attraction is reciprocated.

A correlation of about .60 between the two tests, eight months apart, indicated that though inter-personal relations were somewhat fluid, stability predominated. Age, intelligence, and length of residence showed no significant correlation with the degree to which a person was chosen.

The leaders, as Dr. Jennings calls the popular girls, were described by the housemothers as co-operative, requiring no special attention, having greater insight into their own and others' behavior, making the most of opportunities, doing more than their share of the work, being more reticent, and showing planfulness, initiative, ingenuity, and rebellion against arbitrary authority. These girls had more even dispositions than the least chosen ones, and showed more solicitude for others, especially for those needing help. The least chosen girls were characterized by more complaining, sulking, quarrelsomeness, nervousness, bossiness, interrupting or interfering with group activities, non-cooperation, attention demanding, and spreading of slander and rumors. There were no significant differences between over- and under-chosen with regard to generosity and to cleanliness, neatness, or other personal habits.

Though many traits were found more frequently among the leaders than among the relatively rejected members of the community, there was no one leadership type of personality. One girl might be popular chiefly because of a vivid, energetic personality which bubbled with enthusiasm for one interesting activity after another. A second leader might be attractive mainly because of her quiet helpful interest in her friends. The group was composed of many types of personalities and each leader seemed able to fill only the needs of certain types. Leadership resided not exclusively in the leader herself, but in the interaction between leader and followers.

Exception might be taken to the use of the term "leaders" to describe the persons with whom people like to work and live. The author furnishes no evidence to indicate that all such persons would necessarily be chosen for positions of leadership. The use of the term leadership is but one illustration of the use of a rather grandiose terminology to cover relatively simple and limited phenomena. One wonders, also, whether the "sociometrist" is justified in coining as many elaborate terms as he does. Many chapters bog down with definitions and with slight correlations among unimportant but impressively worded variables. This sometimes prevents the significant contributions made by the author, in this important area of compatibilities and antipathies, from standing out as clearly as they might.

CLARENCE LEUBA.

Antioch College.

WOLFF, WERNER. The expression of personality: experimental depth psychology. New York: Harper, 1943. Pp. xiv+334.

The concept of "personality" is both illusive and tantalizing. Although the term is used freely both by laymen and psychologists, a truly satisfactory definition is not easy to formulate. Wolff, who takes the point of view that "personality is the collective name for the total manifestation of man" (6) is of the opinion that the range of behavior therein included is so great that the term loses its value for scientific purposes. Hence it becomes necessary to isolate certain more limited features for detailed study. At the same time he emphasizes the essential unity of the person, a pervasive one-ness that permeates the entire being and impresses its own individual stamp upon structure and function alike. There is no aspect of form or feature, no individual movement or posture, no action nor achievement but carries its own meaning for him who can read the signs.

Thus, although he points out the practical necessity of investigating single aspects rather than the entire range of the personality, Wolff's experimental approach is radically different from that with which the generality of American psychologists are familiar. The features that he attempts to isolate are not "traits." They are signs, indicators, tendencies that characterize the mass of human beings and thus serve as base lines from which individual variants may be isolated and studied.

This monograph summarizes the results of an extensive series of highly provocative experiments which were begun in Berlin in 1925 and have been continued, later in Spain and most recently in the United States, up to the present time. The intriguing feature of all these studies is the direction of attack which, in sharp contrast to most American studies, is synthetic rather than analytic. Instead of asking, What are the objective signs by which Traits A, B, and C can be recognized and differentiated? Wolff begins with the sign and seeks to ascertain its significance. Moreover, he never limits his possible sources of evidence by forcing the responses of his subjects into a small number of categories that are usually inadequate and sometimes downright misleading. Instead, his questions are broad, non-suggestive as to the type of answer expected. Most important of all, there is, as a rule, no predetermined "right" or "wrong" answer. This is illustrated by his experiments in judging personality from photographs. Instead of starting with the assumption that a particular photograph "portrays" a given emotion or personality type merely because some actor has endeavored to convey that impression when posing, photographs are taken when the subject is unaware that he is being photographed and when he is not under conditions of such unusual stress that the external features of the experiment are likely to mask the internal aspects of the individual personality. These pictures are then submitted to a number of judges individually who are asked simply, "What kind of person do you think this is? Make the best estimate that you can of his personality and character." The same general procedure has been followed with photographs of the hands, specimens of handwriting, recordings of the voice, moving pictures of the gait and of such motor performances as ring-tossing.

The monograph is divided into three parts. The first part is essentially an evaluation of method. The influence of American demands for objective validation of results is clearly seen and frankly acknowledged by the author, but he does not become so preoccupied with statistical computations that he loses sight of the broader issues. His concern here, as indicated by the part-title is with the *Unity of Personality.* The questions that he attempts to answer are, first, How closely do observers agree in their judgments of personality from such external signs as those which have been mentioned? To what extent does the amount of agreement exceed chance? How successful are attempts to match different expressive signs obtained from the same persons, e.g., faces to hands or voices to handwriting?

The devices employed for testing these questions are varied and ingenious. In general the findings obtained were somewhat more positive than would be expected by chance although the rigid statistician will find grounds for questioning a number of the conclusions, especially in view of the small populations employed in most of the experiments. But this does not affect the freshness and originality of the general approach.

Part II, entitled *Self-Confrontation*, is by far the outstanding section of the monograph. Here we have an objective research into the realm of the so-called *Depth Psychology* that has rarely if ever been surpassed. The general procedure employed in a long series of studies utilizing various kinds of material was as follows: The subject was shown a number of specimens of expressive phenomena, one of which was his own. Only such products as are not readily subject to self-identification were selected. Handwriting specimens were shown in mirror image, profile photographs were in silhouette form and so on. In each case, the subject was first asked if he could identify any of the items. Cases in which self-identification occurred were treated separately, but in the majority of instances the subjects remained in ignorance that their own photographs or handiwork were among those shown. Nevertheless, their responses to the self-items were reliably different from their responses to the others in the group. These differences can be characterized roughly as follows: The personality descriptions of the self were in general more favorable, and in practically all instances were more emotionally toned. In some cases the descriptions were highly unfavorable but they were rarely or never colorless or indifferent. A word count revealed a reliable difference in favor of the self-descriptions in average length. In spite of this, the self-descriptions more often than the descriptions of others terminated in a verbally expressed blocking, frequently indicated by an expression of irritation, such as, "Bother! I can't tell you any more about this one," or "This handwriting is too pale; I can hardly see it. I don't know what it means."

In Part III, *Personality Diagnosis*, a number of suggestive procedures are described, together with tentative findings from a few experiments. In general, this part of the book is rather less original than the two foregoing sections, and the data have been less completely analyzed. However, a number of fertile areas of investigation are pointed out, along with promising variations of such well-known techniques as the method of free association and the selective factors in the memorizing and forgetting of selected kinds of material.

The book is illustrated by a number of excellent photographic plates. There is a bibliography of 428 titles and a well organized index.

FLORENCE L. GOODENOUGH.

University of Minnesota.

NOTES AND NEWS

Eleanor Rowland Wembridge, died on February 20. Dr. Wembridge served as assistant professor of psychology, Mt. Holyoke College (1906–12); as professor of psychology and dean of women, Reed College (1912–17); as referee of the Juvenile Court, Cleveland (1926–36); and as clinical psychologist in California from 1936 to her death.

Solomon David Evans, supervisor of the Worker's Analysis Section of the Chicago Occupation Analysis Unit, Federal Security Agency, died January 7th.

Karl F. Heiser, former director of the laboratory of psychology, Norwich (Conn.) State Hospital, has been appointed director of research, Connecticut Public Welfare Council.

Wilbur S. Hulin has been appointed professor of education at Pacific University, Forest Grove, Oregon.

Emily M. Fletcher Cooper has been appointed instructor in psychology, Harcum Junior College, Bryn Mawr, Pa.

Henry B. McDaniel, psychologist and director of vocational guidance for the public schools of San Diego, has been appointed state director of vocational education for California. **Anna Catherine Moser** has succeeded Dr. McDaniel.

C. Hart Westbrook, who was professor of education and psychology in the University of Shanghai, China, and who received his Ph.D. in educational psychology at Harvard in 1920, returned to the United States on the Gripsholm last December 1, after seven months internment in the Japanese internment camp at Shanghai. Professor Westbrook is resting at Richmond with his family and doing some psychometric work at the Medical College of Virginia.

Esther Allen Gaw, dean of women at Ohio State University, has resigned, effective April 1. In announcing Dean Gaw's resignation from the position which she has held since 1927, President Bevis said "Dean Gaw has rendered long and useful service to the University and she will leave behind her in the system that she has established a fine monument."

Philip F. Ashton, professor of psychology, Houghton (N.Y.) College, has been made dean of the college.

Theodora M. Abel has been granted a year's leave of absence from Letchworth Village to work on the problems of adjustment arising among the student body of the Manhattan High School for Women's Garment Trades.

Milton L. Blum, instructor of psychology at the College of the City of New York, is on leave of absence to serve as director of a nation-wide survey of war housing for the John B. Pierce Foundation of New York.

Hazel S. Clapp, senior psychologist at Grasslands Hospital, has been appointed instructor in psychology at Briarcliff Junior College, Briarcliff Manor, N. Y.

The *American Association for Applied Psychology* in September, 1943, authorized the establishment of a Section of Military Psychology. Officers appointed by the Board of Governors are: *Chairman*, Major **T. W. Harrell**, Office of Assistant Chief of Air Staff for Personnel, and *Secretary*, Lieutenant **C. Gilbert Wrenn**, USNR, Bureau of Naval Personnel. The present objectives of the section are: (1) to encourage professional relationships among psychologists in the armed services; (2) to provide for the continued availability to the armed services of technical advances in psychology both during and following the war period. Up to January 1, 90 members of the association had joined the section out of about 115 eligible for membership. Of this group of 90, 50 are serving in the Army or Army Air Corps, and 40 are in the Navy, the Marine Corps or the Maritime Service.

The family of ALBERT H. MUNSELL, as owners of the Munsell Color Company, which for 22 years has carried on his work in color research, has created a non-profit foundation known as the "Munsell Color Foundation, Inc." The purpose of the Foundation is to "further the scientific advancement of color knowledge, and in particular, knowledge relating to the standardization, nomenclature, and specification of color; and to promote the practical application of these results to the color problems arising in science, art and industry." The first Board of Trustees consists of Deane B. Judd, trustee appointed by the Director of the National Bureau of Standards, elected *president;* Lloyd A. Jones, trustee at large nominated by the Optical Society of America, elected *vice-president;* Blanche R. Bellamy, manager of the Munsell Color Company, Inc., elected *secretary;* Dorothy Nickerson, *trustee* appointed by the Inter-Society Color Council; Alexander E. O. Munsell, *trustee* representing the Donor, and Arthur S. Allen and I. H. Godlove, *trustees at large.* Each member of this board is already well known in color science or in industry.

The Seventh Annual Meeting of the *New York State Association for Applied Psychology* was held at the College of the City of New York on Saturday, February 19, 1944. The morning program centered about "Psychology and the war and post-war problems," and the afternoon program about the "Effect of the proposals of the Intersociety Constitutional Convention upon the New York State Association." DOROTHEA MCCARTHY, *President*, gave an address at a luncheon meeting.

Social Research, the quarterly journal of the Graduate Faculty of Political and Social Science of the New School for Social Research, published in its February issue the first complete translation of a paper on "Gestalt Theory" delivered before the Kant Society in Berlin in 1924 by the late Professor MAX WERTHEIMER. Reprints may be obtained from Social Research, 66 West 12th Street, New York 11, N. Y., at 25 cents per copy.

Correction. Because of the dropping out of a line of copy, an unfortunate error was made in the "Notes and News" section of the February *Bulletin.* The item stating that CHARLES FORDYCE had been made head of the department of psychology at Nebraska Central College, should have read "MARY MACFARLANE DOBSON, formerly assistant to Charles Fordyce has been named head of the department of education and psychology at Nebraska Central College." Professor Fordyce died several years ago.

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Psychological Bulletin

HULL'S PRINCIPLES OF BEHAVIOR

A SPECIAL REVIEW*

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I

The experimental procedures of modern psychology show a degree of rigor hardly warranted by the clumsy and rather literary techniques of theory construction in common use. The recent emphasis by students of psychological method on the virtues of such implements of mature natural science theory as hypothetico-deductive procedure and operational definition has done much to improve this situation. Nevertheless, the dominant temper of present psychology is still crudely, if elaborately, empirical; most research is still devoted to the painstaking accumulation of essentially isolated empirical relationships. Professor Clark Hull has long been in the advance guard of those who are trying to supplement the experimental methods of psychology with theoretical procedures of the requisite precision to make empirical results meaningful. The publication of Hull's new book, *Principles of Behavior*, represents the most potent blow thus far struck against this tradition of *naive* empiricism in psychology. At the same time it strikes an equally powerful blow at the complementary disease cluster of literary, programmatic, verbal or speculative theorizing independently of—sometimes in spite of—empirical evidence. For both of these reasons, and for others, *Principles of Behavior* is one of the most important books published in psychology during the twentieth century. No psychologist, whatever his affiliation, can afford the luxury of not reading this immensely challenging work.

Ever since 1929, Professor Hull has been elaborating a comprehensive theory of adaptive behavior based on explicitly stated principles largely deriving from conditioning and other objective learning experiments. Using careful hypothetico-deductive methods and proceeding in cautious, step-wise fashion, Hull has progressively stated, revised and sharpened his postulates and patiently deduced key theorem sequences in a long series of publications. Some of these earlier publications—

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* HULL, C. L., Principles of behavior, New York: Appleton-Century, 1943. Pp. x+422.

particularly the recent *Mathematico-Deductive Theory of Rote Learning*—serve as models of the most advanced and rigorous theory construction as yet to be found in psychology. Each of these publications, however, is restricted to the presentation of a fragmentary sub-system of the total theory of behavior which Hull and his colleagues have been designing. Although these formulations have often been impeccable in form and suggestive in content, it has always been difficult to evaluate the overall scope and adequacy of the entire system. This difficulty has now been obviated by the *Principles of Behavior*.

The new book presents the first published statement of the *entire* postulate set tentatively believed to be capable of generating the major phenomena of organismic behavior. The postulates are stated in conjunction with a full discussion of the experimental evidence and theoretical requirements which guided their formulation, and the explanatory power of the system is illustrated by the informal derivation of some fifty important theorems. If the earlier publications gave any reason for doubting the fruitfulness of Hull's constructs, *Principles of Behavior* should go far toward dissipating such doubt. Hull's previous work left no room for questioning the methodological maturity of his *general* approach; the present work makes it no longer possible to question the value and richness of his *specific* theoretical assumptions.

Another general aspect of the book is worth mentioning before going on to more detailed analysis. One of the most resistant obstacles to progress in psychology has been the multiplicity of theoretical language systems to which investigators order their data. This has resulted in a degree of semantic confusion and spurious controversy unique to the social sciences. The prospects for unified theory in psychology seem a little brighter when it is realized that most "rival" psychological theories may, in spite of their terminological individuality, be regarded as largely intertranslatable variants of only two theoretical approaches: "S-R" theory and "field" theory. The feeling has long been prevalent that these two classes of theory are basically opposed on many crucial issues. *Principles of Behavior* marks a major step toward the reduction of this apparent opposition. Certain changes in Hull's system—notably the recognition of the hypothesis of "neural interaction"—make it possible to deduce from S-R assumptions many of the phenomena formerly assumed by the field theorists to be compatible only with their own tenets. Advocates of unified theory in psychology have reason to be highly encouraged by this development.

Since most field theories are largely programmatic in form, while Hull's theory, although far more explicit, is certainly incomplete and tentative, it is impossible as yet to estimate finally the extent of agreement. But the present form of Hull's system, as exemplified in the new book, makes it seem probable that many of the primary molar assumptions of field theory are deducible as theorems from Hull's *relatively* less molar postulates. As Hull himself says:

> There is much reason to believe that the seeming disagreements among current students of behavior may be largely due to the difference in the degree of the molar at which the several investigators are working. . . . In the end the work of all those who differ only in this sense may find a place in a single systematic structure, the postulates . . . of those working at a more molar level ultimately appearing as theorems of those working at a more molecular level (21).

As already indicated, the substance of the book consists of the statement and elucidation of a tentative postulate set for an objective theory of organismic behavior. The purpose of this postulate set is no less ambitious than to serve as the basis for all the behavior and social sciences. Sixteen postulates are advanced, and special attention is given to the derivation of four "major theorems" pertaining to behavior phenomena of key importance. As the postulates are introduced, their systemic implications are partially explored by the derivation of some fifty additional corollaries. The experimental evidence serving as the inductive source of each postulate is carefully examined, and the inferential operations involved in the formulation of the postulates are, for the most part, clearly specified. It should be stressed that the book does not pretend to be a statement of the entire system. As its title suggests, the book covers merely the foundation principles or postulates of the system. The few theorem sequences that appear are introduced only in order to clarify the significance of key postulates. Since the range of application of the postulate set is presumably as wide as all the social sciences, most of the theorems remain to be deduced. The author looks forward to a long series of investigations which will progressively derive the test theorem sequences relevant to the phenomena of the various social and behavior sciences.

Since Hull's system has attained the stage of quantitative formulation, the task of clear exposition for non-mathematical readers entails formidable difficulties. Hull meets this problem by developing the material verbally and relegating all mathematical formulations to notes at the end of each chapter. In the main this device has succeeded. With the exception of a few fuzzy passages, the bulk of the book should be intelligible to any educated reader with the courage to expose himself to rigorous statement and close knit reasoning. For purposes of clarity, we will confine the present discussion to the verbal level.

Instead of attempting a complete *précis* of this complex work, we will restrict scrutiny to the major postulates and the high spots of the discussion in which they are embedded. After this outline, we will call attention to some of the many ways in which the present statement of the theory has improved on earlier formulations. Finally, we will offer a few constructive criticisms.

II

The book begins with a lucid discussion of the nature of scientific theory. The first chapter presents an analysis of hypothetico-deductive procedure as employed in the natural sciences. Hull stresses the joint importance of the empirical and theoretical components of science, and describes the function of each. Scientific explanation is identified with the *deduction* of theorems expressing a natural event from one or more primitive assumptions or postulates taken in conjunction with the antecedent conditions of that event.

The second chapter discusses the methodological requirements of "objective behavior theory." Here Hull identifies the task of a molar science of behavior as the isolation of "the basic laws according to which various combinations of stimulation, arising from the state of need on the one hand and the state of the environment on the other, bring about the kind of bahavior characteristic of different organisms" (19). Because of the marked incompleteness of present neurophysiological knowledge, Hull very wisely chooses to elaborate his theory on a molar basis. He stresses the valuable point that the development of an adequate neurophysiology of behavior is itself contingent on the *prior* development of an adequate molar or macroscopic theory of behavior. Further, Hull takes pains to indicate that the difference between the molar and the molecular is a relative one. Although "there are degrees of the molar, depending on the coarseness of the ultimate causal . . . units dealt with," he prefers to keep the causal units as fine as possible—"to approach the molecular just as closely as knowledge of (the neurophysiological) substrate permits" (21). This may serve to unconfuse those who have persisted in assuming that Hull is essentially a physiological theorist, or at least a behavior theorist with one foot in physiology.

Hull believes that the adoption of a molar approach entails the use of "intervening variables" (logical constructs) in behavior theory. Intervening variables "represent entities or processes which, if existent, would account for certain events in the observable or molar world" (21). In the physical sciences they take the form of such high order constructs as atoms and molecules, while a concept like "habit" is a typical intervening variable in the behavior sciences. Logical constructs of this sort, however, can only be legitimately used when they are connected by explicit functional relationships with "directly observable events both as antecedents and consequences."

The structural outlines of Hull's system may be viewed as a complex chain of intervening variables interpolated between the independent variables which serve as the observable antecedents of behavior, and the dependent variables which represent measurable aspects of the consequent behavior itself. Among the chief *independent* variables are stimuli (S), conditions which produce drives (C_D), conditions which eventuate in need reduction (G), etc. The chief *dependent* variables are four measurable indices of response (R): "probability of reaction evocation" (p), reaction latency ($_st_R$), resistance to experimental extinction (n) and amplitude (A). The multiple functional relationships between these sets of end terms and the mediating chain of intervening variables are defined by the postulate set.

The initial intervening variable is introduced in *Postulate 1.* This is the "afferent neural impulse" (s) which is generated by the contact of a stimulus energy (S) with a receptor organ. Neurophysiological data suggest that, after a latency period, s rapidly attains maximal intensity and then gradually diminishes to a low value according to a "simple decay function." It is also assumed that s "continues its activity in the . . . nervous system for some seconds after the termination of the stimulus" (47), diminishing to zero as a decay function of its value at the cessation of the stimulus.

The second postulate introduces the critical hypothesis of "neural interaction." This assumes that all afferent impulses simultaneously active in the nervous system interact with each other, partially changing the nature of each. Thus, a new intervening variable—an afferent impulse as modified by neural interaction ($\breve{s}$)—is introduced. This postulate deserves special attention because it introduces into the system for the first time a reference to factors of organizational interdependence of the sort stressed by the field theorists.

The major postulate of the system defines the conditions under which learning occurs. This is *Postulate 4*—the law of "reinforcement" —which introduces the key intervening variable of "habit strength" ($_sH_R$). Habit strength represents the presumptive neural modification of the organism produced by learning. This modification is conceived behaviorally as an increased tendency for a given receptor activity (s) to evoke a given effector activity (r). On a more molar level, habit strength may be expressed as a relation between the parent stimulus of s (S) and the reaction (R) corresponding to r.

The general conditions which determine an increment of habit strength (Δ_sH_r) are simply stated: whenever a receptor activity coincides with an effector activity ($_sC_r$), and is closely followed by the reduction of a need (G), or a stimulus which has been associated with need reduction, there results an increment of habit strength. The *magnitude* of Δ_sH_r is a quantitative function of several measurable aspects of the learning situation. The relations of four of these independent variables to the generation of habit strength have been sufficiently investigated to warrant a tentative quantitative statement of the respective functions. Hull considers each of these relationships along with the relevant experimental evidence in separate chapters. He concludes that $\Delta_s H_r$ is: (1) a positive growth function of the number of reinforcements (N), (2) a positive growth function of the magnitude of need reduction (G), (3) a negative growth function of the delay in reinforcement (t), and (4) a negative growth function of the time difference (t'') between S and R when both are of short duration, or a negative growth function of the time (t') the stimulus acts on the receptor, when S is continuous.

All of these relationships may be expressed in a single complex equation which expresses habit strength as a positive growth function of the number of reinforcements, while the remaining three functions jointly determine the asymptote of the learning curve. Since other factors such as stimulus intensity and vigor of response probably enter into the determination of habit strength, Hull underlines the provisional and incomplete character of the formulation.

Because habit strength is a quantitative construct, a suitable unit of measurement must be introduced. Hull adopts a centigrade unit—the "hab"—which represents "1 per cent of the physiological maximum . . . of habit strength attainable by a standard organism under optimal conditions" (114). Various crude indices of habit strength are available, but the precise operational definition of the hab (and other intervening variable units which we will mention later) is a major unsolved problem of the system. Hull recognizes this (281) and indicates that, at present, units like the hab are used as illustrative devices.

The generality of the law of reinforcement cannot be appreciated without a word about "secondary reinforcement." The occurrence of need reduction (G) constitutes "primary reinforcement." But increments in habit strength may also be mediated by all stimuli which are "closely and consistently associated with G." Such secondary reinforcing agents must be assumed to operate in all learning situations. Experimental evidence suggests that primary reinforcement does not affect stimulus-response coincidences preceding its occurrence by more than about 30 seconds. Thus, the learning of behavior sequences which exceed the range of primary reinforcement is mediated by secondary reinforcement. Recalling that the delay of reinforcement is assumed to generate habit strength according to a *decay* gradient, it is clear that Hull's well known early principle of the "goal gradient" may now be deduced from the gradient of primary reinforcement in conjunction with secondary reinforcement.

Having introduced habit strength, we must now consider further links in the long chain of logical constructs intervening between behavior and its antecedent conditions. *Postulate 5*—the principle of "stimulus generalization"—introduces the concept of "effective habit strength" ($_{S}\overline{H}_{R}$). The facts of stimulus equivalence suggest that reinforcement eventuates not only in a connection between the *particular* receptor-effector activities reinforced, but in the connecting of a wide zone of *similar* receptor activities to the reaction in question. Since the actual stimulus of reaction evocation (S) must always differ from the stimulus of original conditioning ($\dot{S}$), behavior cannot be predicted from the habit strength commanded by the learning stimulus. Rather, one must know the effective habit strength commanded by the *evoking* stimulus. Postulate 5 specifies the function linking effective habit strength to habit strength.

Differences between the afferent impulse of original reinforcement and the evoking impulse may be expressed in terms of j.n.d. units (discrimination thresholds) on the corresponding stimulus continuum. This being the case, postulate 5 states that effective habit strength is a joint negative growth function of the strength of the reinforced habit, and the magnitude of the difference (d) between the afferent impulse of original conditioning ($\dot{s}$) and the evoking impulse (s). The form of this function is suggested by Hovland's experiments on pitch and intensity generalization, and the postulate may be formulated mathematically by equations fitted to Hovland's data.

From postulate 4 (reinforcement) and the principle of stimulus generalization, there flows a theorem of considerable importance. This is "Major Corollary I" which maintains that "all effective habit tendencies to a given reaction . . . . which are active at a given time summate according to the positive growth principle exactly as would the reinforcements which would be required to produce each" (199). This principle of "physiological summation" functions in the derivation of many important behavior phenomena. For instance, it accounts for the "paradox" that superthreshold learning is able to occur in spite of the fact that each reinforcement yields a subthreshold habit increment to connections which are never *exactly* repeated. Again, physiological summation facilitates derivation of many properties of "compound conditioned stimuli"—such as the experimentally verified (Woodbury) tendency for a compound to evoke a smaller amplitude of reaction than the sum of the reaction amplitudes evoked by its components when presented separately. To take a final important example, this principle is instrumental in deducing the phenomena of stimulus *patterning*.

Another factor which must obviously be represented among the intervening variables which determine behavior is the *need* state of the organism at the time of action evocation. Needs operate not only in the formation of habits (i.e., in the process of reinforcement), but in "their subsequent functioning" (247). Since this is the case, an intervening variable representing the joint effects of effective habit strength and drive in the causation of behavior is necessary. This requirement is satisfied by the construct of "reaction potential" ($_SE_R$).

The relationship of $_SE_R$ to $_SH_R$ and drive intensity (D) is suggested by a very impressive experiment performed by Perin. Using groups of rats in a Skinner box learning situation, Perin determined the resistance of the learned habit to extinction ($_SE_R$) as a joint function of (1) the number of reinforcements ($_SH_R$) and (2) the number of hours of food privation (D) preceding extinction. Fitted equations indicate reaction potential to be a multiplicative function of habit strength and strength of drive, at least when these variables are identified with the terms of Perin's experiment.

Perin's experiment plus a survey of much evidence relating to primary motivation suggest two additional postulates. *Postulate 6* assumes that "associated with every drive (D) is a drive stimulus (S_D) whose intensity is an increasing monotonic function of the drive in question" (253). *Postulate 7* states that:

> Any effective habit strength ($_S\overline{H}_R$) is sensitized into reaction potentiality ($_SE_R$) by all primary drives active . . . at a given time, the magnitude of this potentiality being a product obtained by multiplying an increasing function of $_S\overline{H}_R$ by an increasing function of D (253).

Hull conceives the sensitizing action of drive on habit strength to be mediated by chemical "drive substances" (e.g., endocrine secretions) which are released into the blood stream. In the case of some drives (e.g., sex) these substances presumably initiate the drive stimulus, while in the case of others (e.g., tissue injury) the reverse relation obtains. A programmatic unit for the measurement of drive strength—the "mote"—is defined as one per cent of the maximum possible drive strength for a standard organism. A similar centrigrade unit for the measurement of reaction potential is called the "wat." Postulates 6 and 7 make possible the deduction of many of the major phenomena of primary motivation.

Hull regards experimental extinction as an adaptive mechanism of the first importance because it leads to the elimination of those unfunctional habits which are no longer followed by need reduction. Consequently, some provision for the effects of extinction and related processes must be made among the intervening variables of the system. To this end, Hull introduces the construct of "inhibitory potential" ($\dot{I}_R$), and defines its functional properties in the eighth and ninth postulates.

The analysis of inhibition takes its departure from the Mowrer-Miller hypothesis which assumes, among other things, that whenever a reaction is evoked, there results a condition which acts as a negative drive state in that it tends to cause a cessation of the activity which produced the condition. This fatigue-like condition is called "reactive inhibition" (I_R). But, if reactive inhibition is tantamount to a negative drive state, then its reduction after each reaction would "constitute a reinforcing state of affairs." This means that all stimuli "closely associated with the cessation of a response" must become conditioned to the corresponding reactive inhibition (I_R), thus resulting in "negative habits" tending toward cessation of the response. In this way there emerges a second inhibitory mechanism: "conditioned inhibition" or ${}_SI_R$. The performance of any reaction necessarily involves the generation of *both* reactive and conditioned inhibition, and it is assumed that the two types of inhibition summate physiologically exactly as would positive habit tendencies. The net result of such summation is called "total inhibitory potential" ($\dot{I}_R$).

Reactive inhibition is implicitly defined in the first part of *Postulate 8*. Succeeding parts of the postulate state two conditions, suggested by available experimental evidence, which govern the amount of *total* or net inhibition ($\dot{I}_R$). The first states that the amount of $\dot{I}_R$ produced by successive reactions is "a simple linear increasing function" of the number of reactions. The second supposes that $\dot{I}_R$ is a positively accelerated increasing function of the *work* involved in the response (Mowrer-Jones experiment). A final portion of postulate 8 assumes that *reactive* inhibition "spontaneously dissipates as a simple negative growth function of time" (300). Postulate 9 defines the notion of conditioned inhibition and indicates that it summates physiologically with reactive inhibition.

Returning to the chain of intervening variables which govern behavior, it is clear that reaction potential (${}_SE_R$) will only determine final reaction to the extent that it overrides total inhibition ($\dot{I}_R$). In order to represent this a new construct—"effective reaction potential" (${}_S\bar{E}_R$)—must be added to the system. Effective reaction potential is defined as reaction potential minus total inhibitory potential. A suggested unit of inhibitory potential—the "pav"—represents "that amount of I_R which will just neutralize one unit of reaction potential" (280).

The introduction of postulates 8 and 9 makes possible the derivation of a large number of familiar learning phenomena. Among the more immediate implications are theorems pertaining to the following phenomena: the generalization of extinction effects, spontaneous recovery, disinhibition, inhibition of reinforcement, reminiscence and the economy of distributed practice. Of great significance is the capacity of these assumptions to generate as a theorem the tendency for organisms (other things equal) to choose behavior sequences involving minimal energy expenditure. Field theorists have attributed similar phenomena to the operation of a *primary* principle of behavior—variously designated as the law of "parsimony," "least action," etc.

With the construct of ${}_S\overline{E}_R$ before us, we are still some distance away from the final variable which determines reaction. The next link which must be added to the complex chain of constructs makes allowance for the ubiquitous *variability* of organismic behavior. Even reactions mediated by highly stable habits tend to oscillate in vigor, latency and other ways from one performance to another. *Postulate 10* makes "behavior oscillation" a lawful part of the system by introducing the construct of "${}_SO_R$" (oscillation of reaction potential).

Learning experiments (Hays and Woodbury, Thorndike), which record the vigor of a great number of reactions performed by individual organisms at the limit of learning, suggest an approximately *normal* distribution of the oscillating reaction intensities. Such data make it reasonable to suppose that "the variability of reaction under seemingly constant conditions is due to the action of an oscillatory force [${}_SO_R$] upon the effective reaction potential" (313), and that ${}_SO_R$ "approaches a normal chance distribution" (314). Neurophysiological factors which could conceivably provide the rationale for such an assumption are the spontaneous variability of reaction latencies and thresholds found in individual axon fibres (Blair and Erlanger), and the random, spontaneous firing of nerve cells (Weiss).

Other properties tentatively assigned to ${}_SO_R$ in postulate 10 are: (1) it is identified as an "inhibitory potentiality," (2) its "range, maximum and minimum are constant," and (3) the "amount associated with the several habits of an organism at a particular instant is uncorrelated" (319). Since the presence of ${}_SO_R$ will necessarily depress the value of the associated effective reaction potential, an additional construct is needed to represent the remainder. This is the "momentary effective reaction potential" (${}_S\overline{E}'_R$).*

This ingenious analysis of variability has important methodological consequences for psychology. It implies that psychological prediction must be essentially statistical in the sense that momentary *individual* behavior can be predicted only within a certain probability range. Again, it suggests that all behavior laws must *necessarily* be formulated in terms of the central tendencies of large numbers of empirical determinations. Finally, Hull believes that, in part, "behavioral oscillation . . . is responsible for the present relatively backward state of the behavior (social) sciences" (319).

An eleventh postulate introduces the notion of the "reaction threshold" (${}_SL_R$). The obvious fact that in learning situations "several reinforcements are frequently required before the stimulus will evoke the reaction" indicates that reaction potential must exceed a certain inertial factor before reaction can be evoked. Thus $_SL_R$ may be defined as the minimal effective reaction potential which will evoke observable reaction. *Postulate 11* simply asserts that $_S\bar{E}'_R$ "must exceed the reaction threshold . . . before a stimulus will evoke a given reaction" (344).

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* A prime (′) by the side of the bar has been substituted for the dot over the bar used in this symbol by Hull.—EDITOR.

At this point, the intervening variable chain of the system is completed. Postulates 1 through 11 have quantitatively moored these variables both to their antecedent conditions and to each other. They must now be related with equal explicitness to the various "observable" aspects of the consequent reactions. In other words, the functional relations of the "pivotal" construct $_S\bar{E}_R$ to (1) probability of reaction evocation (p), (2) reaction latency ($_St_R$), (3) resistance to extinction (n) and (4) reaction amplitude (A) must be determined. These relationships are expressed in postulates 12 through 15.

In order to determine the four relationships, Hull analyzes the equations for characteristic empirical learning curves plotted in terms of each of the four reaction measures into two components. One component equation expresses $_S\bar{E}_R$ as a function of the number of reinforcements (N), and the second component expresses the particular response measure in question as a function of $_S\bar{E}_R$. Since $_S\bar{E}_R$ is an unobservable, this is a rather delicate task. Each of the four learning equations, however, turns out to "contain an explicit positive growth function of N." Recalling that the postulates of the system imply that, other things equal, $_S\bar{E}_R$ is a positive growth function of N, it is permissible to regard these functions as the equations determining $_S\bar{E}_R$. The equations for each of the response measures as a function of $_S\bar{E}_R$ may now be derived by replacing the growth expression in each equation by $_S\bar{E}_R$.

Using the above procedure, Hull derives the four tentative relationships stated by postulates 12–15. They are: (1) p is a normal probability function of $_S\bar{E}_R$, (2) $_St_R$ is a negatively accelerated decreasing monotonic function of $_S\bar{E}'_R$, (3) n is an increasing linear function of $_S\bar{E}_R$, and (4) A is a linear increasing function of $_S\bar{E}'_R$.

The final postulate of the system—the sixteenth—deals with the problem of what happens when a stimulus complex gives rise to two or more incompatible reaction potentials. Although learning experimentation suggests the occurrence of "associative inhibition" under such circumstances, Hull is not prepared as yet to state the function determining possible "indirect inhibitory effects." Thus, for the present, Hull merely assumes in postulate 16 that when reaction potentials to two or more incompatible responses are active at the same time, "only the reaction whose momentary effective reaction potential . . . is greatest will be evoked" (344).

After completing the statement of the postulate set, Hull devotes a very impressive chapter to the derivation of a theorem sequence concerning "the patterning of stimulus compounds." This represents the first detailed quantitative analysis of patterning ever attempted, and so demands more strenuous examination than can be made in this review.

Stimulus patterning means the ability to react to certain combinations or configurations of stimuli "differently than to the component conditions" (376). The principles of the system generate a large number of quantitative theorems which specify the extent to which such patterning will occur under various conditions of learning. The key assumptions which make possible these deductions are the principles of afferent interaction, reinforcement, physiological summation, generalization of reaction potential and generalization of conditioned inhibition. These and other principles of the system imply that, under conditions of differential reinforcement, patterning will tend to occur. In addition, even when a compound is reinforced non-differentially, a limited degree of "spontaneous patterning" will be in evidence. Other theorems indicate that the degree of patterning is an "increasing function of the degree of interaction effects among the components," "simultaneous compounds will be easier to pattern than temporal" compounds, "the longer the time interval separating the components in a temporal compound, the more difficult the patterning" (377), etc.

III

When two psychologists discuss Hull, they are usually talking about different men. Because of the frequent revisions and extensions which have marked the laborious development of the theory, a person's impression of the system often depends on where he discontinued reading the long series of Hull's publications. The plurality of Hulls, distinguishable in successive publications, is certainly confusing, but this hardly justifies evaluation of the system in terms of an outmoded or partial formulation. Many of the difficulties and gaps detectable in earlier statements have been eliminated from the theory in its present form. For this reason, it will be useful to mention some of the many improvements which have been incorporated into the theory as represented in *Principles of Behavior*.

A favorite criticism directed against Hull by field theorists maintains that Hull, like most "associationists," is essentially a *historical* theorist. Presumably, this means that he derives behavior from conditions established in the past history of the organism (habit connections) and neglects the *momentary* determinants of behavior (the "field"). This criticism was never wholly justified, but now is less so than ever. If the field theorists ever had a point it was only to this extent: in certain early formulations of the theory Hull tended to derive behavior from "excitatory tendencies" directly established by reinforcement. About the only *momentary* "antecedent condition" explicitly taken into account was the stimulus complex (including the drive stimulus) impinging on the organism. This is no longer the case. The only "historical" construct now found in the system is $_{S}H_{R}$ (past learning). Hull derives behavior not directly from $_{S}H_{R}$, but from $_{S}\overline{E}'_{R}$. But $_{S}\overline{E}'_{R}$ is a *joint* function of past learning ($_{S}H_{R}$) and a host of other factors representing *momentary* conditions of behavior such as (1) the position of the stimulus on the generalization gradient, (2) the intensities of all present drive states, and (3) the oscillation of reaction potential.

The point may be clarified by showing the analogy in the functional status of Hull's chief constructs and those of a field theorist like Lewin. Effective habit strength serves the same purpose for Hull that "cognitive structure" does for Lewin: both of these constructs represent the learning organizations which function in the determination of behavior *at a given time*. The calculation of specific values for *both* of these variables *necessarily involves reference to historical factors* (prior reinforcement for Hull, prior field exposure for Lewin). Again, reaction potential is analogous to the Lewinian notion of "psychological force"; in both theories the respective constructs are jointly determined by momentarily active learning structures and concurrent *motivation*.

The only difference that would seem to remain between Hull and field theorists in their regard for momentary behavior determinants is that Hull states their assumed relations to his intervening variables in full and quantitative detail, while the field theorists do not. We must conclude that if due regard for the manifold of momentary factors which determine behavior is what makes a theorist a "field" theorist, Hull is the arch field theorist of them all.

A second change, related in part to the preceding point, concerns Hull's general treatment of motivation. There has always been a certain ambiguity in Hull's approach to the problems of primary motivation. The only functional property formerly assigned to drive (D), in addition to its role as a necessary condition to reinforcement, was its capacity to provide a "persistent source of stimulation" (S_D). Hull appeared to be trying to deduce all of the phenomena of primary motivation from the presence of S_D as a conditionable stimulus during all learning situations (and other non-motivational principles of the system). In *Principles of Behavior*, Hull explicitly assigns an additional property to drive: drive states are associated with a chemical drive substance which exerts a sensitizing effect on the habit structures mediating response evocation. Thus, during the functioning of habits, drives are now seen to have an energizing effect quite independently of their role as conditioned stimulus elements of evoking stimulus compounds. Furthermore, the first attempt on record is made to determine quantitatively the *amount* of this energizing effect on the operation of learned habits, as a function of the strength of the concurrent drive (Perin experiment). In this manner an incomplete, and in some respects inadequate, theory of motivation gives way to one of the most explicit and plausible theories now available.

Two additional improvements of crucial significance must be considered together. The first is the introduction, as intervening variables, of the "afferent neural impulse" (*s*) and the "efferent discharge" (*r*). The second is the adoption of the principle of "afferent neural interaction" (postulate 2). Most of the earlier statements of the system phrased all learning connections in terms of stimuli (*S*) and responses (*R*) rather than in terms of the *immediate* receptor and effector processes involved. This being the case, the system was forced to approach most of its problems on a much more crudely molar basis than at present, and it was impossible to cope effectively with such basic phenomena as compound conditioning and patterning. Since it is meaningless to speak of mutual interaction effects as occurring among external stimulus processes, the interpolation of *s* and *r* was a first necessary step to the treatment of interaction effects of the sort peculiar to psychology. And the next obvious step was the introduction of the principle of neural interaction itself. Only by virtue of these modifications has the system been able to come to grips with configurational problems of the type so vigorously emphasized by the field theorists.

Although it is unrealistic to expect an early *rapprochement* between Hullian "*S-R*" theory and field theory, these modifications open up a bridge which could conceivably lead to ultimate reconciliation. There is even a possibility for immediate *cooperation*. A basic unsolved problem of Hull's theory is the determination of the conditions which govern the amount and *character* of neural interaction effects. The great mass of field (*gestalt*) experimentation on the organizational determinants of perception may already contain useful hints at some of the answers. Additional work along the same lines may help fill out the picture.

Another advance may be noted in Hull's present analysis of inhibition. In early publications, inhibitory tendencies (inhibitory potential) were assumed to accumulate only as a result of non-reinforcement. The present assumptions about reactive and conditioned inhibition—particularly those suggested by the Mowrer-Miller hypothesis—greatly extend the range of phenomena which the system can adequately explain.

The present form of the system contains so many marked advances over one or another of the earlier versions that any selection of the *major* improvements is bound to be arbitrary. Those who have not read *Mathematico-Deductive Theory of Rote Learning* will find that the qualitative functions and informal deductions characteristic of the bulk of the early articles have been supplanted by quantitative functions and stricter derivations. Again, at many places (e.g., the delay of reinforcement gradient) quantitative relationships previously assumed have been modified on the basis of fresh experimental evidence. In general, then, the right to make a serious evaluation of Hull's system must be purchased by a careful reading of *Principles of Behavior*.

IV

Now for a few final evaluative comments. It is easy to point to many aspects of the system which are incomplete, based on tenuous experimental foundations, or lacking in rigor. But in most cases this would not be news for Hull. So clearly aware is Hull of the *provisional* character of his formulations, and the presence in the system of many open questions, that one hesitates to raise critical points. Thus, the following remarks are offered as constructively motivated suggestions rather than objections.

One vital question, which demands more explicit discussion than Hull has yet volunteered, surrounds the significance of the empirical constants which appear in the mathematical statement (equations) of many of the postulates. These equations are derived by curve fitting techniques from the empirical data of specific learning experiments. The usefulness of such equations in the derivation of behavior will depend on the *generality* of their parameters. To what extent can it be assumed, for instance, that the growth constants appearing in a given empirical learning curve will hold for (1) all learning situations of the same type, (2) other types of learning situations, (3) other species of organisms in either similar or quite different learning situations? Again, to what extent will individual differences in the values of these constants appear among organisms of the same type in the same learning situation? Is the inability of the system to predict momentary *individual* behavior due to these differences as well as to the oscillation of reaction potential? The reviewer believes that some of these questions can be answered at present. Others must wait on a protracted program of experimental research. Even if *no* final answers are as yet possible, however, such questions should be explicitly raised and at least provisionally discussed.

A second and somewhat related consideration pertains to the principle of primary stimulus generalization (postulate 5). The assumed form of the generalization gradients for quality and intensity is based on

Hovland's experiments on *auditory* (pitch and intensity) generalization. An important but neglected question is whether similar generalization gradients would be found in other sensory modalities. Again, there seems to be a basic ambiguity in Hull's analysis of the stimulus (and afferent impulse) continua along which reinforcement presumably generalizes. A "continuum" into which independently variable stimulus elements (e.g., pitch) may be ordered is one thing. The "continuum" corresponding to a dimension of similarity along which a stimulus *object* may vary (e.g., Hull's example of the rotation of a die on its axis) is another. Generalization effects along these two types of "continua" cannot be treated in the same manner, and will probably not assume the same form.

A third point which suggests itself may actually constitute more a virtue of Hull's procedure than a limitation. This is Hull's tendency to fit equations to empirical curves containing fewer data plots than caution might dictate. Some of the curves to which Hull fits key equations of the system contain no more than three or four data points. For instance, Perin's curve for resistance to extinction as a function of hours of food privation (preceding reinforcement constant) contains only four data points. The Mowrer-Jones curve of the number of extinction reaction as a function of work contains only three. Although the limits of "safe" extrapolation are more or less arbitrary, it is better to underestimate those limits than to overestimate them. This is particularly the case when dealing with the admittedly variable, and as yet quantitatively unexplored, data of psychology.

Nevertheless, it must be acknowledged that the desirable is not always the practicable. Provisional quantification—even when based on a restricted range of data—is preferable to no quantification at all. One can only admire Hull's scientific courage in sacrificing the security of vague qualitative generalization for the hazards of exact quantitative statement.

A fourth suggestion relates to an apparent implication of Hull's present analysis of inhibition. According to postulate 8, "the amount of net inhibition ($\dot{I}_R$) generated by a sequence of reaction evocations is a simple linear increasing function of the number of evocations" (300). Since the accumulation of inhibition is assumed to occur independently of whether the reaction is followed by reinforcement, the phenomenon of "inhibition of reinforcement" must be expected to occur. This means that empirical learning curves will rise only to the extent that the habit strength resulting from successive reinforcements exceeds the concurrent accumulation of inhibition. Recall now that habit strength is assumed to be generated according to a positive growth function and, thus, that the increments of habit strength progressively decrease with each successive reinforcement. This consideration together with postulate 8 implies that when, at the limit of learning, increments of habit strength are becoming infinitesimally small, the concurrent increments of inhibition are becoming *progressively larger.*

The preceding deduction seems rather strange. It suggests that empirical learning curves carried well past the limit of practice should show a marked and positively accelerated fall as additional training is continued. Although the occurrence of inhibition of reinforcement effects has been fairly well verified, they do not seem to show either the magnitude or the form demanded by this deduction.

Another question arises in connection with one of Hull's symbols. The symbol "G" stands for: "a need reduction or a stimulus which has been closely associated with a need reduction; primary reinforcement; also a primary goal reaction" (404). This diversity of meanings is bewildering enough. The confusion is multiplied, however, when we find in a diagram of the chief variables of the system (Fig. 84, 383) that G is represented as one of the "observable antecedents" to which the intervening variables are anchored. Now, in so far as "G" stands for the *process* of need reduction or primary reinforcement, it must be regarded as itself an *intervening variable.* To the extent that "G" indicates a primary or secondary reinforcing *stimulus,* or an overt goal reaction, or any other condition which *gives rise* to need reduction, it can be considered an *independent variable* (antecedent condition). Thus, it would be helpful to analyze the rather flexible G into at least two components, one standing for the intervening variable, and the other for the parent independent variable. One possibility might be to let "C_G" stand for the antecedent conditions which give rise to need reduction (on the analogy to C_D). "G" might then stand for the intervening variable corresponding to the *process* of need reduction or reinforcement. The clarity and precision with which other symbolic distinctions of the system are worked out makes it all the more necessary to remedy this defect.

A final methodological consideration concerns Hull's views on the nature of intervening variables. Hull very reasonably assumes that legitimate intervening variables must be "securely anchored to directly observable events both as antecedents and consequences" (29). This is unquestionably true. Nevertheless, certain confusions are likely to arise if no attempt is made to examine the character of these "observable events" more closely. Intervening variables are rarely, if ever, *directly* linked to terms representing singular observations. Instead, they are typically related to independent and dependent variables which themselves are relatively high order scientific constructs. Characteristic independent variables in Hull's system are "stimulus" (S), "conditions which give rise to drive" (C_D) or to need reduction (G), while among the dependent variables appear such constructs as "number of reactions preceding extinction" (n). These terms clearly cannot be equated with "directly observable events." Rather they represent empirical constructs which themselves must be defined in terms of their antecedent conditions and the consequent results. Ultimately, of course, such constructs must be reducible to classes of sentences containing "observable predicates." It should be emphasized that the independent and dependent variables appearing in most scientific laws have this character.

If Hull had made these considerations explicit, he could have dismissed the objections of extreme positivists to the use of intervening variables much more vigorously than he does at various places in the book. Hull's primary argument against positivistic procedure is that intervening variables represent a "convenience in thinking, i.e., an economy in the manipulation of symbols" (111). Of course they do. But the basic absurdity of the positivistic approach is that the constructs which are considered legitimate (independent and dependent variables) *have the same logical form* as the intervening variables which are held illegitimate. If intervening variables must go then, on the same grounds, most independent and dependent variables must go. This leaves all the brute observables one might desire, but no science.

Principles of Behavior arrives at a time when the withering *corpus* of the social sciences requires radical therapy. The war has seen a widespread resurgence of anti-scientific, metaphysical and theological speculation in the social sciences. There are some who mistakenly believe that the application of scientific methods to behavior and society has been tried and—witness the present social crisis—has failed miserably. Nothing could be further from the truth. If the social "sciences" have not realized their promise, this is primarily due to the *absence* of rigorous scientific method. The remedy is to make the social sciences more scientific, not less so. As a concrete step in this direction, the importance of *Principles of Behavior* cannot be overemphasized.

INTERACTION IN ANALYSIS OF VARIANCE INTERPRETED AS INTERCORRELATION

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In this article it will be shown that analysis of variance, reviewed by Garrett and Zubin as a research technique in the April, 1943, number of the *Psychological Bulletin* (1), can be readily pursued into a further analysis with much enrichment in its meaning, increased precision in its use, and a tie-in to the older statistical concepts. In particular, it will be shown that "interaction" is expressible in terms of the intercorrelation between classes, which reduces in the case of two classes to the long-familiar test of significance where matched groups are compared. But first it may be well to remark that "analysis of variance" as the term is customarily employed in tests of significance, is something of a misnomer which is likely to lead to misunderstanding. The variance of *a sample* can be analyzed into parts so long as one stays within the sample, as shown by Garrett and Zubin (1, pp. 234–235); but the technique as used in practice deals almost entirely with estimates of the *population* variance. That the population variance is not analyzed into constitutuent parts, which sum to a predetermined whole, is illusted by the fact that the "mean squares" (the estimates of the population variance) given on page 240 of the article do not add up to the 185.2 that would be estimated from the total sum of squares.* It is the *sum of squares* that is analyzed into parts; then from each constituent sum of squares that interests us a population variance is estimated by dividing by the appropriate *n*. Then these estimates are compared to ascertain whether they differ in magnitude more than chance fluctuation in sampling would justify. It would be much more enlightening to call the process *comparison* of variances. Otherwise when we bring this system into juxtaposition with other procedures where the term is employed in a different (and correct) sense, confusion is likely to result. (Compare, for example, 5, p. 33)

As a basis for seeing that "interaction" is expressible in terms of intercorrelation, let us run through the very simple derivation of the formula for average intercorrelation. Let $x_1, x_2, \cdots x_a$ be scores on a different measuring instruments (forms of a test, ratings by judges, etc.), each taken as a deviation from the mean of its series. Then, if σ_s^2 is the variance of the sums of the scores for the N individuals,

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* It will be assumed that the reader of this article will get the Garrett and Zubin (1) article before him as he reads. Otherwise my article will be largely meaningless.

$$\sigma_s^2 = \frac{\sum(x_1 + x_2 + \cdots + x_a)^2}{N}$$

$$= \frac{1}{N} \sum (x_1^2 + x_2^2 + \cdots + x_a^2) + \frac{1}{N} \sum (x_1x_2 + x_1x_3 \cdots) .$$

The elements in the first parenthesis are variances of the several forms of the measures and those in the second parenthesis are correlations between the forms if each is multiplied by $\sigma_i\sigma_j$. If we assume equal variances, take the r's to be nearly enough alike to permit treating them as an average designated by r_{II}, and take cognizance of the number of each type that we would have in the complete expansion, we would have:

$$\sigma_s^2 = a\sigma_i^2 + a(a-1)r_{II}\sigma_i^2$$

$$(a^2 - a)r_{II}\sigma_i^2 = \sigma_s^2 - a\sigma_i^2$$

$$r_{II} = \frac{\sigma_s^2/\sigma_i^2 - a}{a^2 - a} . \tag{1}$$

We can put this in terms of the means of the scores instead of their sums by observing that, since a elements enter into each sum, $\sigma_s^2 = a^2\sigma_m^2$. So

$$r_{II} = \frac{a^2\sigma_m^2/\sigma_i^2 - a}{a^2 - a} = \frac{a\sigma_m^2/\sigma_i^2 - 1}{a - 1} . \tag{2}$$

This is the formula for the average intercorrelation among columns of a matrix table when m represents the means of the values on a row and σ_i^2 is the sample variance of a column assuming equal variances in the several columns. Since the assumption of equal variances is seldom perfectly fulfilled, we determine the column variance by taking a weighted average over all the columns, just as is the practice in analysis of variance; only, we stay with the *sample* variance.

Since no detailed table illustrating analysis of variance into three parts, with consequent interaction, is given by Garrett and Zubin, and since we imperatively need one to carry our point, let us set up the accompanying simple hypothetical one.

Suppose that five different methods of teaching are being tried out in each of six school systems. The mean made by each school is entered in its respective cell. For the present we shall pay no attention to any special characteristic of the rows but center attention only on the columns.

MEAN SCORES BY SCHOOLS AND BY METHODS

Schools	Methods						
	1	2	3	4	5	Sums	Means
1	25	27	24	28	22	126	25.2
2	24	32	29	26	24	135	27.0
3	31	35	27	36	26	155	31.0
4	40	45	33	42	30	190	39.0
5	43	50	38	46	33	210	42.0
6	45	48	40	52	36	221	44.2
Sums	208	237	191	230	171	1037	34.6

We shall be comparing the success of the five methods by comparing the means of the five columns. This we shall do by "analyzing the variance" into two parts, one associated with the means of the several columns and the other with the "error" element. To do this we compute a variance of the means (standard-deviation-squared) and estimate a population variance of the individual *schools* by multiplying this by the ratio $kn/(k-1)$, where k is 5 (the number of columns) and n is the number of entries in each column, which is 6 in our table. In practice we would proceed in a different but equivalent way: we would divide the sum of the squares of the means taken as deviations from the total mean by $(k-1)$, each mean having been taken n times. Then we would make another estimate of the population variance from the scatter within the several columns, taking each score as a deviation from its own column mean. In column 1 the sample variance would be

$$\sigma^2 = \frac{\sum(y-\bar{y}_c)^2}{n_c}$$

and, because we estimate the population variance by dividing the sum of squares by $N-1$ instead of by N (**2**, p. 70), the estimate of the population variance would be

$$s_{ci}^2 = \frac{\sum (y-\bar{y}_c)^2}{n_c} \cdot \frac{n_c}{n_c - 1} = \frac{\sum (y-\bar{y}_c)^2}{n_c - 1}. \tag{3}$$

But since we wish a more stable estimate than that from a single column, we take a weighted average over all the columns, then divide by the sum of the weights, and have:

$$s_c^2 = \frac{1}{\sum_1^k (n_c - 1)} \sum_1^k (n_c - 1) \cdot \frac{(y-\bar{y}_c)^2}{n_c - 1} = \frac{\sum\sum (y-\bar{y}_c)^2}{N-k}. \tag{4)*}$$

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* There is a more mathematically rigid method of deriving this formula, by the use of calculus, which arrives, however, at the same result. See (**2**) pp. 349–350.

We now have two estimates of the population variance, which are known to be independent. If there is no law present which involves that the mean by one method of teaching is higher than by another, these estimates will be equal within the limits of sampling fluctuation. It would have been feasible to test this difference by the usual subtraction method with suitable tables of the distribution of the differences in standard terms. But R. A. Fisher chose to test the difference by *dividing* one by the other instead of subtracting, and tabled certain levels of probability of getting half the natural logarithm of this quotient. Snedecor translated these log values directly into the corresponding ratios between the variances, which he called F.

We spoke above of getting the "within the column" variance directly in the usual manner of computing a variance from the sum of squared deviations from the mean of an array. But while this is entirely feasible and is desirable as an arithmetic check, it is also feasible to get the necessary sum of squares by subtracting the sum of squares "between means" from the total sum of squares. This grows out of what happens when we set up the identity,

$$(y - \bar{y}) = (y - \bar{y}_c) + (\bar{y}_c - \bar{y})$$

square the polynomial, and sum over the N of the sample. The cross products vanish (sum to zero), and we have

$$\sum (y - \bar{y})^2 = n\sum (\bar{y}_c - \bar{y})^2 + \sum \sum (y - \bar{y}_c)^2 \cdot$$

The two sums of squares that we drew upon for the estimate of the population variance as discussed above are the two on the right in the equation. It will be seen that these two partial sums of squares aggregate the one on the left. This illustrates the additive character of the sums of squares. It will also be seen that the denominators by which we divided our two sums of squares $(k-1)$ and $(N-k)$ add to the $N-1$ by which we divide the total sum of squares to make the optimum estimate from it. That illustrates the additive character of the "degrees of freedom."

The arithmetic values accruing from our table above when thus analyzed into two parts are as follows:

	sum of squares	*df*	"mean square" (Est. of Pop. V.)
Between methods	497	$5-1$	124.25
Within method columns (residual)	1740	$30-5$	69.6
Total	2237	$30-1$	—

Thus the estimate of the population variance from between the means is 124.25/69.6 = 1.78 times that from within the columns (the "residual" or "error" factor). Reference to Snedecor's table (4, page 185) shows that, with 4 and 25 degrees of freedom, it takes an F of 2.60 to be significant at the 5 per cent point and one of 3.86 to be significant at the 1 per cent point. So no significant differences among the means of methods is suggested by this over-all comparison.

But now let us take cognizance of the arrangement by rows. Let us suppose that all of the schools of row 1 are from cities of a certain size of population; and let us suppose a similar meaning for each of the other rows. Let us further suppose that these rows represent cities of increasing size as we go from row to row, although such hierarchical arrangement is not necessary for our purpose. It is only necessary that the schools be matched on some criterion along the rows.

We now take cognizance of that matching by analyzing into three parts instead of two. To do this we compute a further sum of squares from the means of the *rows*, just as above we did so from the means of the columns. Since all the sums of squares must add up to the old total,* this new sum of squares must be taken out of the residual. But then the new residual sum of squares must be divided by $(k-1)(n-1)$ instead of by $(N-k)$ to make the optimum estimate of the population variance. The arithmetic values now are:

	sum of squares	*df*	Est. of Pop. V.
Between methods	497	$5-1$	124.25
Between schools	1588	$6-1$	317.6
Residual	152	(5)(4)	7.6
Total	2237	$30-1$	—

When now we make an F ratio out of the residual estimate of the population variance (7.6) and the between methods (124.25), we get an F of 16.3, which is very highly significant. If we had made a two-part analysis of schools without considering methods, we would have obtained an F of 12.2; so that the three-part analysis shows much higher significance than either alone. Since there is a joint effect that differs from either alone, it is said to be due to the interaction between the two: in this case, to the manner in which size of school affects the success of the methods.

We are now ready to show that this interaction is definitely expressible in terms of the average intercorrelation among the columns.

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* This arises out of squaring and summing the identity,

$$(y-\bar{y})=(\bar{y}_c-\bar{y})+(\bar{y}_r-\bar{y})+[(y-\bar{y}_c)-(\bar{y}_r-\bar{y})]$$

which, since the cross products sum to zero, gives:

$$\sum(y-\bar{y})^2=n\sum(\bar{y}_c-\bar{y})^2+k\sum(\bar{y}_r-\bar{y})^2+\sum\sum[(y-\bar{y}_c)-(\bar{y}_r-\bar{y}]^2$$

Let us get before us again the analysis of sums of squares involved above. When analyzed into two parts

$$\sum (y-\bar{y})^2 = n\sum (\bar{y}-\bar{y}_c)^2 + \sum\sum (\bar{y}_c - y)^2 \cdot \tag{5}$$

The analysis into three parts gives

$$\sum(y-\bar{y})^2 = n\sum(\bar{y}-\bar{y}_c)^2 + k\sum(\bar{y}-\bar{y}_r)^2 + \sum\sum(y-\bar{y}_c-\bar{y}_r+\bar{y})^2 \cdot \tag{6}$$

Now (6) differs from (5) only in the fact that $k\sum(\bar{y}-\bar{y}_r)^2$ is taken out of the residual. The fact that this is $nk\sigma^2_{m_r}$ should at once suggest from (2) that it is expressible as a function of the intercorrelation. In these new terms the a of (2) is k, the σ_m^2 is $\sum(\bar{y}_r-\bar{y})^2/n$, and the $\sigma_i^2=\sum\sum(y-\bar{y}_c)^2/nk$. So in our new terms, by some algebraic juggling from (2),

$$k\sum(\bar{y}_r - \bar{y})^2 = \frac{(k-1)\sum\sum(y-\bar{y}_c)^2 r_{II}}{k} + \frac{\sum\sum(y-\bar{y}_c)^2}{k}.$$

This, as said, is taken from the residual of (5) to give (6). There is left in the residual

$$\sum\sum(y-\bar{y}_c)^2 - \frac{(k-1)r_{II}\sum\sum(y-\bar{y}_c)^2}{k} - \frac{\sum\sum(y-\bar{y}_c)^2}{k} \cdot \tag{7}$$

If the r_{II} is zero, this leaves

$$\frac{(k-1)\sum\sum(y-\bar{y}_c)^2}{k}.$$

To estimate the population variance this new residual must be divided by $(k-1)(n-1)$, which gives

$$s^2 = \frac{\sum\sum(y-\bar{y}_c)^2}{k(n-1)} = \frac{\sum\sum(y-\bar{y}_c)^2}{N-k}.$$

But this is exactly the same as the estimate from the residual in analysis into two parts. So the change from interaction is nothing if the average intercorrelation of the columns is zero.

If r_{II} equals 1.00, we have from (7)

$$\sum\sum(y-\bar{y}_c)^2 - \frac{(k-1)\sum\sum(y-\bar{y}_c)^2}{k} - \frac{\sum\sum(y-\bar{y}_c)^2}{k} = 0 \cdot$$

Thus if the columns are perfectly intercorrelated, the estimate of the population variance from the residual is zero and the F is infinite. Whenever the columns are positively intercorrelated, the error (residual) estimate is descreased and the reliability of the determination increased; when the average intercorrelation is negative, the residual estimate is increased and the reliability lessened; and when the average intercorrelation is zero, the estimate is unchanged.

By putting the elements of (7) over a common denominator and simplifying, we can place the residual directly in correlation form. We have for the new residual.

$$\frac{(k-1)(1-r_{II})\sum\sum(y-\bar{y}_c)^2}{k} \tag{8}$$

The population variance is estimated from it by dividing by $(k-1)(n-1)$, giving

$$s_{rk}^2=\frac{(1-r_{II})\sum\sum(y-\bar{y}_c)^2}{k(n-1)}=(1-r_{II})\frac{\sum\sum(y-\bar{y}_c)^2}{N-k}=(1-r_{II})S_c^2 \tag{9}$$

Thus the estimate of the population variance after taking account of interaction is $(1-r_{II})$ times as great as it was before.

Often the data permit a further estimate of the population variance with which to compare the interaction: one from within the cells. Each of the 30 schools in our illustration had a number of pupils who individually got scores. If U is the number in a cell (a school) and the deviations are taken from the mean of the cell,

$$s^2=\frac{\sum(y_i-\bar{y}_i)^2}{U-1}$$

But the estimate is unstable if taken from a single cell, so we shall take an average over all the cells, weighting each for its n and dividing by the sum of the weights, as in (4). Thus we have an estimate of the population variance of individual observations (scores of pupils) by the formula

$$s^2=\frac{\sum\sum(y_i-\bar{y}_i)^2}{N(U-1)}$$

where N is the number of schools and NU the total population of pupils in the sample. This estimate of the population variance of individual pupil scores can be compared with the estimates of means of schools with which we dealt above by multiplying the latter values by U. It is from 8 such individuals in each of 8 cells that Garrett and Zubin (1, p. 246) get their $64-8=56$ degrees of freedom.

This showing that interaction is expressible in terms of intercorrelation would be merely pedantic if it were not for the fact that it can lead us on to a much enriched interpretation of what we have and can suggest more precise further studies. We can direct our attention to the behavior of the columns in this respect and see, in the case of our illustration, that all the methods tend to be more successful as the cities in which they are employed are larger. Of, if the cells have been placed in rows on some other criterion, we can perceive that the scores from all the schools of a row tend to rise or fall together and, even if the rows have not been ordered in some hierarchical manner to begin with, we can speculate about what the characteristic is on the basis of which the methods are intercorrelated and can then pursue further the suggested hypotheses. A corresponding further analysis and pursuit would be possible if the average intercorrelation were negative, suggested by the increase in the residual from interaction. Or inspection of the columns might show that some pairs are positively intercorrelated and some negatively. To this situation the interaction variance would not do justice, because the negative and the postive r's would cancel each other. Of course, if the null hypothesis were fulfilled, columns would not thus behave individualistically; but the facts are not changed by making an assumption. Common sense would suggest that we override the over-all evidence from interaction, lift these cases out for more analytic treatment, and pursue by more precise methods the hypotheses suggested by the observation.

But the fact that interaction is expressible in terms of intercorrelation is especially illuminating when there are only two columns. When we analyze into three parts, the new error factor becomes, as examination of (9) will show,

$$s_c^2(1 - r_{12}) \tag{10}$$

where s_c^2 is the estimate of the population variance made from two columns treated as independent, estimated as follows:

$$s_c^2 = \frac{\sum (y_1 - \bar{y}_1)^2 + \sum (y_2 - \bar{y}_2)^2}{N_1 + N_2 - 2}$$

and r_{12} is the correlation coefficient between the two columns. If these two columns were being treated by the t technique, which is always a feasible alternative with two groups, the t would be for the independent groups which are implied where we analyze into only two parts, and the N's are equal as they must be if we are later to analyze into three parts,

$$t = \frac{\bar{y}_1 - \bar{y}_2}{\sqrt{\dfrac{s_c^2}{N} + \dfrac{s_c^2}{N}}}. \tag{11}$$

When now we analyze into three parts so as to take account of the interaction, our new estimate of the population variance for the denominator becomes that indicates in (10). Substituting this in (11) we have

$$t = \frac{\bar{y}_1 - \bar{y}_2}{\sqrt{\frac{s_c^2(1 - r_{12})}{N} + \frac{s_c^2(1 - r_{12})}{N}}}.$$

The two elements under the radical can be segregated into a shape that has a very familiar form, as follows:

$$t = \frac{\bar{y}_1 - \bar{y}_2}{\sqrt{\frac{s_c^2}{N} + \frac{s_c^2}{N} - \frac{2r_{12}s_cs_c}{N}}}$$

$$= \frac{\bar{y}_1 - \bar{y}_2}{\sqrt{\sigma_{m_1}{}^2 + \sigma_{m_1}{}^2 - 2r_{12}\sigma_{m_1}\sigma_{m_2}}}.$$

So the interaction technique gives us our old formula for the standard error of the difference between matched groups where the correlation is (rightly) taken into account, and where a common variance is estimated from the two groups. But here there would have been available a more precise alternative involving even less labor: it is to *subtract* the paired variates instead of adding them, from which paired differences the standard error of the difference between the means is (2, p. 164–165)

$$\sigma_{m_1 - m_2} = \frac{\sigma_{y_1 - y_2}}{\sqrt{N - 1}}.$$

This is more precise because it makes fewer assumptions; it does not assume equal variabilities in the two arrays since the paired differences are normal variates having as such a variance with the usual sampling distribution without regard to the relative magnitudes of the variances of the two arrays which yielded them as differences. And the t from it has a known "exact" distribution; it was, in fact, the type of material for which "Student" originally developed his distribution.

The fact that interaction is expressible as intercorrelation ought to suggest that analysis of variance applied to testing the reliability of a test, cited by Garrett and Zubin on page 249, would yield to a further illuminating interpretation. And it does. The "between individuals" sum of squares is N times the variance of the averages of the paired items, and (2) shows that this has the makings of the coefficient of correlation between the tests. In fact a little algebraic juggling shows that the difference between the sum of the squares for "between individuals" and the sum of squares for interaction divided by the sum of these two sums is the reliability coefficient of the test. But this assumes equal variance in the two arrays, a rough assumption. The F_2 test is a form of testing whether the obtained coefficient differs significantly from zero, seldom an important test for a reliability coefficient. The F_1 test is precisely the t test (actually t^2) of the significance of the difference between the means of the two forms where the denominator of the t ratio is the one that correctly takes account of the coefficient of correlation between the arrays but assumes a common variance for the two arrays. The t test taken from the difference between the two means divided by the standard deviation of the paired differences over the square root of $(N-1)$, as said in our preceding paragraph, avoids this assumption, is arithmetically easier, and has an "exact" distribution.

Garrett and Zubin (1, p. 250) say that the difference between the sum of squares "between individuals" and the sum of squares for interaction divided by the sum of these two sums (which they put in sample variance terms) is the *intraclass* correlation while, in our last preceding paragraph, we called it the *interclass* correlation. The intraclass correlation differs from the interclass only in the fact that the former takes all deviations from a common mean while the latter takes the deviations in each array from the mean of its own array (2, p. 201). It will be worthwhile to give the evidence why I believe the analysis of variance method gives the interclass correlation with assumption of equal variances rather than the intraclass.

For two arrays the interclass correlation, assuming equal variances is (2, p. 103):

$$r_{12} = \frac{2\sigma_m{}^2}{\sigma_i{}^2} - 1 = \frac{2\sum m^2/N}{\sum\sum (y-\bar{y}_c)^2/2N} - 1$$

$$= \frac{4\sum m^2}{\sum\sum (y-\bar{y}_c)^2} - 1 = \frac{4\sum m^2 - \sum\sum (y-\bar{y}_c)^2}{\sum\sum (y-\bar{y}_c)^2}.$$

But $\sum\sum(y-\bar{y}_c)^2$ is the sum of squares from within classes when we analyze into two parts. When we analyze into three parts and thus get an interaction sum of squares, the old residual sum is broken into a new residual sum and a new "between means" sum (here into the "interaction" sum and the "between individuals" sum), as shown in (5) and (6). Hence $\sum\sum(y-\bar{y}_c)^2$ can be replaced by these two parts, which for simplicity we shall designate $2\sum m^2$ and $\sum w^2$. So we have

$$r_{12} = \frac{4\sum m^2 - 2\sum m^2 - \sum w^2}{2\sum m^2 - \sum w^2} = \frac{2\sum m^2 - \sum w^2}{2\sum m^2 - \sum w^2}.$$

(In the language of analysis of variance, the sum of squares between means is $k\sum m^2$, and k is 2 here in the case of two columns. Division of numerator and denominator by $2N$ yields the V's of Garrett and Zubin). Whether this is intraclass or interclass correlation depends upon whether the deviations in $\sum\sum(y-\bar{y}_c)^2$ are from a common mean or from the means of the respective columns. It is the universal practice in analysis of variance to take them in each column from the mean of that column; and that is why I believe this to be the old stand-by interclass correlation.

But surely we would not wish to introduce the intraclass correlation to describe the reliability of a test. For it would combine into a meaningless fusion the two very unlike features of difference between the means of the two forms and order of size of scores. We could not put the intraclass correlation to the practical uses to which we put the reliability coefficient, such as predict or regress with it or correct inter-function correlations for attenuation.

So far we have been talking about the interaction that arises by analyzing sums of squares into three parts when we have cells arranged in rows and columns that can be conceived of as making hierarchical arrangements, and we have shown that the interaction is then expressible in terms of intercorrelation. Thus there is brought together in each cell a different combination of the row and column factors. This same phenomenon could be pursued through analysis of variance into four parts in the Latin square and into five parts in the Greco-Latin square. Here there would be more multiplex combinations of factors. But the interaction could still be expressed in terms of correlations, since each new sum of squares of means of classes has the makings of a coefficient of correlation. But interaction effects are also studied in a more direct manner, as set forth by Garrett and Zubin on page 245. Here factors in various combinations are set up for direct experimental comparison. Each of these may be compared with a control, in which case there will be (k-1) comparisons, if k is the total number of cells. But also each may be compared with every other. Then the "degrees of freedom" will not add up to one less than the number of cells but to many more. But some of these comparisons will not be "independent"; for when both a and b have been compared with c, a and b have thereby a basis for comparison with each other. But Snedecor (4, p. 343) recommends, with his characteristic common sense, that the comparisons be made anyway if they are important to us.

The presentation of these results in tables is often baffling to the uniniated because of inadequate notation. One degree of freedom is assigned to each cell. But one degree of freedom in this connection always means that *two* means are being compared ($k-1=1$); it would be a great kindness to the reader if the writer would indicate clearly *which two*, and not only the single one. And it will be wholesome for the reader to keep in mind that any test with one degree of freedom where variates are involved could, if one chose, be made by the t test for difference between means; for in the denominator of the t formula we want the best estimate we can get of the population variance, and to take this estimate from a combination of the many classes instead of only two does not disturb the fundamental nature of the t test. Even if the F test with two means is a little more convenient for penciling, and can be displayed more compactly in tables, thinking will be kept more clear if the reader will always keep firmly in mind that the thing that is going on is the long-familiar one of testing the difference between two means by comparing that difference to its standard error.

We have shown in this article that "interaction" is capable of further enriching interpretation beyond its surface meaning in terms of intercorrelation among the classes (columns or rows), and that such further analysis leads into the further testing of suggested hypotheses by more precise methods. We could make a similar showing with every one of the Fisher techniques explained in the Garrett and Zubin article.* They are *over-all* procedures, designed to discover quickly those hypotheses which may be dismissed without further labor, usually conducted as preliminary researches with small samples. Or, if they are done with adequately large samples, they are a first-over investigation for purposes of orientation to give leads for the more analytic investigation of suggested hypotheses with the same data. They have healthily encouraged systematic sampling, and replication in sampling, which have hitherto received too little attention in our field. They also lend themselves to compact presentation of data and to the mechanization of the arithmetic so that it can be readily assigned to clerical workers. But for this latter advantage we pay a very heavy price—too heavy—if it brings about the consequence that workers operate only with the mechanics while failing to understand clearly the fundamentally simple things they are doing, and if the presentation of the studies in publication takes a form that the bulk of the readers can not fully understand and pass critical judgment upon. In particular, the additive character of sums of squares and of degrees of freedom, which is merely an algebraic byproduct rather than a fundamental principle, is likely to invite procedures that rest on magic and authority. It may be a little more awkward in exposition and in arithmetic to get one's eye every time on the sum of squares for a class of observations or of statistics and compute an estimate of its population variance by dividing by $(n-1)$ or some function of that, but that procedure keeps the process clearly understandable. When we do hundreds of these each day, it will be time to introduce the arithmetic short-cuts and the other advantages of mechanistic procedure.

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* I have shown elsewhere that analysis of variance is a form of the unbiased correlation ratio (2, p. 353–357) and that analysis of covariance can be simply and profitably set up as a regression technique for matching groups for experiment without loss of population (3).

And when, instead of stopping with the over-all tests of significance as if they were the end of the story rather than its beginning, we continue into the more analytic procedure that lies beyond, and to the more precise pursuit of the suggested hypotheses, we shall find ourselves able to tie in what we have with the long-growing central stem of classical statistics. But when we go beyond the Fisher statistics we shall not merely return to the old classical statistics; we shall advance into some further developments and refinements of precision that lie as definitely beyond the present levels of the "new" statistics as it now lies beyond the "old." And, strange though my promise may seem, this further development can be achieved within the understanding of the rank and file of readers who have hitherto understood statistics, because they will synthesize on a higher level and generalize the "old" and the "new" instead of leaving the present gap between them.

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NOTE: SHALL AFFILIATED ORGANIZATIONS HAVE DIRECT REPRESENTATION ON THE PROPOSED COUNCIL OF REPRESENTATIVES?

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By a unaminous vote, the New York State Association for Applied Psychology, at its Annual Meeting on February 19, approved a Resolution requesting the Joint Constitutional Committee to eliminate the Board of Affiliates and nine Regional Representatives from the proposed APA reorganization, and to substitute therefore *direct representation* on the proposed Council of Representatives for organizations of psychologists now affiliated with the APA or AAAP.

The afternoon session considered the proposals of the Intersocietal Constitutional Convention for a reconstituted APA and dissolution of the AAAP. Dr. A. T. Poffenberger presided. Dr. Alice I. Bryan of the Joint Constitutional Committee outlined the present plan and discussed its implications. Miss Margaretta Weber and Dr. Herbert B. Williams presented a series of questions with respect to the effect of the plan on affiliated organizations of Applied Psychology.

In opening the session, Dr. Poffenberger emphasized the importance of the reorganization of our scientific and professional societies. He indicated that what we have at present is a result of 50 years of haphazard growth, and that it is the hope of those concerned with the problem that some kind of national pattern can be set up which will better serve the professional and scientific needs and standards of psychologists. He further emphasized that the present status of the reorganization plan was in the nature of a series of proposals, and that final action is yet to be taken by the membership of the APA and the AAAP.

Dr. Bryan pointed out that the impetus for the proposed merger arose out of the recognized need for establishing a permanent central office with a full-time Executive Secretary to function for the profession of psychology on a year-round basis. She further emphasized that one national association would not only eliminate over-lapping memberships and multiplicity of dues, but would also enable the professional and scientific functions of psychologists to be carried on more expertly than at present. Dr. Bryan concluded her presentation by pointing out alternatives to the present proposals; namely, the maintenance of the *status quo*, the postponement of a plan of unification until after the war, or the modification of present proposals between now and the final voting.

Miss Weber outlined in some detail the advantages and disadvantages of the present proposals. She indicated that there would doubtless be many advantages to be derived from a strong centralized national organization of psychologists, so long as the professional needs and interests of regional and State groups were not neglected. In preparation for the meeting Miss Weber pointed out that she had discussed the proposals with various members of the Association. Some members, with whom Miss Weber had talked, wondered whether the present plans were sufficiently mature to be ready for acceptance or rejection by this year. Others questioned the fairness of a vote on the proposition this year with so many psychologists serving in the Armed Forces. Some members were concerned lest the proposed national organization be controlled by the so-called academic psychologists. Miss Weber also indicated that the status of Associate members in the merged organization and the prerogatives of the proposed Committee on Committees had not been made sufficiently clear in the tentative By-Laws published in the November 1943 issue of the *Psychological Bulletin.* In concluding, Miss Weber questioned the soundness of the proposed Regional Representatives to the Council of Representatives, in view of the fact that such delegates would not actually represent functioning organizations of psychologists.

Dr. Williams pointed out that the proposed merger of the APA and the AAAP no doubt could be accurately described as a proposal for a reconstitution of the present structure of the APA. A fundamental question, he indicated, is whether such a reconstitution of the APA would advance Psychology as a profession. He doubted whether a new APA would be as successful in this regard as the present AAAP and existing regional organizations in the applied field. Dr. Williams felt that the present proposals might lead to a national organization which would function for psychology mainly as the American Association for the Advancement of Science functions for many areas, rather than result in a national association devoting its energies to the development of Applied Psychology. Pointing to the accomplishments of the American Association of Social Workers, Dr. Williams emphasized that this organization of professional people had, in a relatively short time, established a growing institution in the non-academic, applied field. Some states have already enacted legislation which require that a social worker be licensed in order that definite standards of competency be maintained by those practicing in this field. Perhaps a reconstituted APA might be able to achieve some such recognition for psychologists as professional people. If so, he added, he would like very much to see a full consideration of this possibility before final action is taken on the proposed reorganization. In concluding, Dr. Williams indicated that the war has revealed a scarcity of psychologists competent to meet many problems which properly lie within the field of Applied Psychology. Much of the work now being done by social workers in connection with personnel selection, personality studies, guidance, etc., would more properly belong to Applied Psychology. No doubt such work would be carried on by more psychologists had we the professional schools in Applied Psychology. Unfortunately, most of our graduate schools have not developed professional training programs to meet such needs. If something is not done about this situation, either by academic psychologists or by professional psychologists in the applied field, psychology will continue to "miss the boat." This will be true not only with regard to the various areas mentioned but also in connection with the Rehabilitation Program now being organized to serve the needs of men and women returning from the Armed Forces.

During the open discussion following Dr. Williams' remarks, several members voiced the opinion that if the plan for a new APA is adopted, and if such a national organization is really to represent psychologists in all parts of the country and serve their professional needs, then at least the already established regional associations in the applied and non-applied fields should have *direct representation* on the congress of the national organization. Otherwise, a highly centralized national organization might easily lose sight of the State legislative and other special problems of local constituents.

Adoption of Resolution at the Business Meeting

At the business meeting of the Association, Dr. Peatman opened the discussion by presenting a resolution which would modify the proposed By-Laws by permitting regional organizations now affiliated with the APA or AAAP to have direct representation on the proposed Council of Representatives. He indicated that, in view of the afternoon discussion and the tentative status of the proposed By-Laws, the Association was hardly in a position to go on record as either approving or disapproving the proposed reconstitution of the APA and attendant dissolution of the AAAP.

In support of the resolution, it was pointed out that direct representation on the congress of a national organization would serve to implement the development of the professional needs and interests of the 17 regional associations now affiliated with the APA or AAAP. Furthermore, direct representation would give a fair amount of really organized regional balance to an otherwise highly centralized national organization. The resolution would substitute direct representation of affiliate organizations for the proposed nine Regional Representatives and a Board of Affiliates. The so-called Regional Representatives would hardly serve any satisfactory purpose, inasmuch as they would be responsible to no active regional associations. Furthermore, the interjection of a Board of Affiliates between affiliated organizations and the congress of a national organization would not only be an indirect method of representation but would be cumbersome and inadequate to serve the needs of affiliate groups.

During the discussion it was further pointed out that the adoption of the resolution would serve to clarify the general structure of the proposed organization. There would be representation in the congress not only of the various fields of Psychology (by the Division Representatives), but there would also be minority representation (by Affiliate Representatives) for the special professional needs of geographically localized groups. It was emphasized that, in the long run, the affiliate organizations would in all likelihood be the particular groups of professional psychologists who could more frequently gather, rub elbows and exchange ideas. The direct representation of affiliate organizations on the Council of Representatives should therefore prove to be a continuous vitalizing influence for a national association, and at the same time facilitate the recognition by State legislatures and by local institutions of the work and standards of both local and national organizations. It was pointed further out that the intent of the Resolution is to permit regional associations with 50 or more members (the same minimum proposed for Interest Divisions), and now affiliated with the APA or AAAP to become Charter Affiliates of the reconstituted national association at the time it is established. Should all of the existing affiliate organizations have the minimum number of members deemed appropriate and wish such affiliation and consequent direct representation on the Council, there would be an initial maximum of 17 Affiliate Representatives. Even if the Council should prove to have an initial minimum of but 60 Division Representatives, an initial possible maximum of 17 Affiliate Representatives would not only be a minority of the Council as a whole but would comprise only five or six (at most) more representatives than provided for under the plan of nine Regional Representatives and a minimum of two representatives from the Board of Affiliates.

Whether new regional groups of psychologists could affiliate with the national association after its reconstitution would, of course, depend on a vote of the entire Council. Consequently there would be no danger of Affiliate Representatives running away with or swamping the Council membership. It was pointed out that the machinery for the admission of new affiliate organizations or for the discontinuance of old ones could be similar to the By-Law structure already proposed for the admission and discontinuance of Interest Divisions.

The additional suggestion was made, during the discussion of the resolution, that a provision be added recommending non-pluralistic voting for Affiliate Representatives. It was also emphasized that the present and future functions of the Board of Affiliates of the AAAP could well be taken care of by a standing committee of the National organization. The membership of such a committee could be drawn from the Affiliate Representatives on the Council; in fact, the special professional interests of affiliate organizations in applied psychology could be served by a standing committee on Affiliate Organizations of Applied Psychology.

The following resolution was then put to a vote and unanimously adopted:

WHEREAS, The proposed By-Laws appropriate to a reconstituted American Psychological Association include a Board of Affiliates to represent affiliated organizations and also include nine Regional Representatives,—a structure of organization that would give rise to needless duplications of effort and to inefficiency in administration; and

WHEREAS, Active organizations of psychologists, bound together by interests and professional work within geographical divisions, such as several states, a state, or a metropolitan area, would under the proposed By-Laws have no direct representation on the proposed Council of Representatives; and

WHEREAS, The proposed Interest Divisions of a Reconstituted American Psychological Association would be organized on national lines and on the basis of more restricted functional activities and interests in psychology of a minimum of fifty (50) Associates and Fellows of the Association,

THEREFORE, BE IT RESOLVED, that the New York State Association for Applied Psychology requests the Joint Constitutional Committee to eliminate the proposed Board of Affiliates and the nine Regional Representatives and substitute therefor, on a permissive basis, Affiliate Representatives to the Council of Representatives for organizations of professional psychologists within geographical divisions, such as several states, a state, or a metropolitan area, and composed of a minimum of fifty (50) members, each such affiliate organization to be represented in the proposed Council of Representatives by one Representative, who shall be an Associate or Fellow of the national Association and who shall be chosen from and elected by the members of such affiliate organization, provided, however, that persons who are members of more than one such affiliated organization shall have the privilege of voting for the candidates to the Council of Representatives of but one affiliated organization at the time of nomination and election of Affiliate Representatives.

NOTE ON PSYCHOLOGY IN OCCUPIED SHANGHAI

C. HART WESTBROOK*

Early in the Sino-Japanese War, the Japanese took possession of the grounds and buildings of the University of Shanghai and held them for more than two years before returning them to their owners, the Northern and the Southern Baptist Foreign Mission Board of America, who were neutrals at that time. But the apparatus in the psychological laboratory, as with most of that in the physics, chemistry, and biology laboratories, was looted or destroyed. During the year 1937–38 the University, therefore, was forced to conduct its classes in elementary General Psychology without any laboratory work.

In the Fall of 1938, the St. Johns University of Shanghai, the Soochow University, and the Hangchow Christian College, began to cooperate with the University of Shanghai in the conduct of certain courses, particularly in those which involved the use of laboratories and libraries. At the same time the Committee for Christian Colleges and Universities in China, from its headquarters in New York City, came to the assistance of the universities in the purchase of such apparatus for our common use as could be obtained abroad or could be constructed under our supervision in Shanghai. I served as the Chairman of the Laboratory Committee for Psychology. Out of the lump sum available some funds were allocated for psychological apparatus. By hunting out little shops which were hidden away here and there in Shanghai, I was able to secure the construction of a number of simple pieces for the laboratories in General and Educational Psychology; we also purchased a few pieces from abroad. All four institutions had access to this apparatus and the laboratory in which it was placed. To the best of my knowledge, this equipment is still available for use by St. Johns University and the Hu Kiang Institute. The latter is a temporary organization set up to function after the University of Shanghai's Board of Directors suspended the University in February,

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* With the author's permission, this note is taken from a letter written to the Editor of the *Psychological Bulletin*, who felt that the contents were of general interest. Professor Westbrook says that after the occupation he knew less about what was happening in "free China," than we in America can learn from the Shanghai *Evening Post* and *Mercury*, which are now published weekly in New York City. Hence, he speaks only for psychology in a limited area of China under conditions of occupation. Dr. Westbrook, who received his Ph.D. in Educational Psychology from Harvard in 1920, was formerly Professor of Psychology and Education in the University of Shanghai. For seven months he was interned in the Japanese internment camp at Pootung. He returned to the United States on the *Gripsholm* on December 1, 1943.

1942. The two other cooperating institutions disbanded about the same time and moved to free China. I had about eighty students each year in the laboratory courses at the University of Shanghai, Hangchow College had about sixty, and St. Johns had perhaps forty or fifty. I turned over the laboratory to Professor Chang, formerly of the Great China University, who took up my work in the Hu Kiang Institute, when I had to drop out before being interned by the Japanese at Pootung, across the Hwangpoo River, Shanghai.

Separately, the four Christian institutions conducted their own courses in General and in Educational Psychology, as well as in Child and Adolescent Psychology. But in order to save the time of the instructors and to broaden the list of offerings, they cooperated in courses in Experimental, Abnormal, and Social Psychology, and in Mental Hygiene. Professor J. H. Wiley (for three years) and Professor Arthur Chen, and Mr. C. T. Djang, both of the University of Shanghai, gave courses in Social Psychology. Professor Florence Sherriff and Professor James H. Pott, of St. Johns, taught courses in Social Psychology and Abnormal Psychology, respectively. Acting President W. B. Nance of Soochow University, and Dean T'an of Hangchow College, gave courses in their own institutions in General Psychology, and in General and Educational Psychology, respectively. I supervised senior theses in different phases of psychology related to my courses for the students of the University of Shanghai. Apart from this research by seniors and except for some experimentation in methods of teaching, neither the staff members nor the students had the time or the equipment to conduct any psychological research above the requirements for the Bachelor's degree at our University. A similar situation, so far as I know, held in each of the three other cooperating institutions.

The private institutions organized and operated by the Chinese apart from the Christian institutions, were bombed early in the war with Japan (1937). Except for small "token" groups of teachers and students, they moved out into free China before conditions made further moving impossible. Hence, at present there is nothing to be reported from the groups left in Shanghai. Doubtless the Chinese institutions, in cooperation with the University of Nanking, the Tsing Hwa University of Peking, and other universities, have carried on some psychological work in their new locations in the West. The China National Research Institute, formerly of Nanking, which also moved out, must have carried its apparatus and library into the interior before the fall of Nanking and is probably continuing to do some solid work. At least we hope so.

American institutions and scholars will have a great opportunity to assist both the numerous privately owned Christian colleges and the

Government colleges and universities in rebuilding their laboratories and their libraries after the close of World War II. I should certainly like to make such a request for our own institution, as well as for all others in the East China area which have suffered great losses. Of particular importance will be files of scientific periodicals. I would urge psychologists to preserve their journals and to make them available after the war to the bombed out and damaged universities and libraries of the world, in which the need for basic scientific literature will be great.

PSYCHOLOGY AND THE WAR

Edited by
DONALD G. MARQUIS

CONTENTS

Research Program on Psychomotor Tests in the Army Air Forces by *Staffs PRU No. 2* and Department of Psychology, School of Aviation Medicine.................................. 307
A Blinker Adaptation of Thurstone's 1943 Code Aptitude Test by *H. B. Carlson* and *J. Rich*.............................. 322

RESEARCH PROGRAM ON PSYCHOMOTOR TESTS IN THE ARMY AIR FORCES

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STAFF, DEPARTMENT OF PSYCHOLOGY, RESEARCH SECTION
*School of Aviation Medicine, Randolph Field, Texas**

This article is the fourth in a series describing the Aviation Psychology Program of the Army Air Forces. The first article (4) presents a general outline of this program. The second and third articles (5, 6) deal with research activities at Psychological Research Units Nos. 1 and 3, Nashville, Tennessee, and Santa Ana, California. The present report treats the research activities of Psychological Research Unit (PRU) No. 2, San Antonio Aviation Cadet Center, San Antonia, Texas, and of the Department of Psychology, Research Section, School of Aviation Medicine, Randolph Field, Texas.

I. Organization and Personnel

In the development and evaluation of psychomotor tests in the Aviation Psychology Program, the Department of Psychology and PRU No. 2 shared responsibility. Frequent meetings of the officers have been held for the purpose of mutual presentation, discussion, and decision regarding such problems as the design and evaluation of new psychomotor tests, details regarding the administration of research psychomotor tests, statistical procedures to be employed in the analysis of research data, and preparation of final research reports. The design and production of psychomotor tests is the primary responsibility of the Department. The administration of experimental and classification tests to cadets and the refinement of administration procedures are primary responsibilities of PRU No. 2. Both units undertook statistical analyses. These procedures apply to research projects undertaken jointly by the two organizations; both the Department and PRU No. 2 carry on independent as well as joint research projects.

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* This article is based on the annual reports for the fiscal year of 1943, prepared by the staffs of Psychological Research Unit No. 2, and the Department of Psychology and covers the period from the beginning of the units to 30 June 1943. The materials were abstracted and edited in the Psychological Branch, Research Division, Office of the Air Surgeon, Headquarters Army Air Forces, Washington, D. C.

In addition, other psychological units have contributed ideas and developed several psychomotor devices.

A. *Psychological Research Unit No. 2*

The principal functions and objectives of PRU No. 2 are as follows:

(1) the testing of aviation cadets and students and recommending them as pilots, bombardiers, or navigators on the basis of psychological aptitude tests, ratings of interests, and flying experience; and

(2) the collecting of data and carrying out of research relating to the construction, improvement, and development of psychological aptitude tests for this purpose.

In the fulfillment of the second of these functions PRU No. 2 has worked in close collaboration with the Department of Psychology.

The procedures for processing cadets at PRU No. 2 are the same as those described in the previous articles (5, 6). PRU No. 2 is under the technical supervision of the Air Surgeon, through the Surgeon, AAF Training Command. The beginning of the unit dates from the arrival of Major (now Lt. Colonel) Robert T. Rock, Jr. in November, 1941, who served as Director of the Unit until he became Director of the AAF Classification Center, San Antonio Aviation Cadet Center, on 25 March 1943. Major A. C. Tucker acted as Director during the last part of the fiscal year 1943. As of 30 June 1943, the personnel of the unit consisted of seventeen officers and ninety-two enlisted men. All of the officers were graduates of accredited colleges or universities with either an undergraduate major in psychology or graduate work in this field. A large proportion held advanced degrees in psychology. A majority of the enlisted men had the bachelor's degree with a major in the field of psychology, and approximately 20 per cent held advanced degrees. Rosters of the names of the officers and enlisted men who have been on duty in the Aviation Psychology Program at PRU No. 2 prior to 30 June 1943, follow.

Officers Who Have Been Assigned to Psychological Research Unit No. 2

Crannell, Clarke W.
Crawford, Meredith P.
Dailey, John T.
DuBois, Philip H.
Erickson, Stanford C.
Finch, Glen
Ghiselli, Edwin E.
Grether, Walter F.
Henneman, Richard H.
Hildreth, Glenn W.
Killian, Frank, Jr.
Kleinsasser, Alvin J.
Lepley, William M.
McClelland, William A.
Payne, Robert B.
Rock, Robert T.
Sperling, Philip I.
Tucker, Anthony C.
Vallance, Theodore R.
Wallace, S. Rains
Weitz, Joseph
Weston, Julien V.
Youtz, Richard P.
Zielonka, William A.

Enlisted Men Who Have Been Assigned to Psychological Research Unit No. 2

Adams, Jack D.
Ahner, Charles W.
Anderson, Carl L.
Anderson, Evans L.
Amundsen, Earl H.
Applezweig, Mortimer H.
Armitage, Stewart G.
Atkinson, Norman
Bacon, Franklin, Jr.
Baker, John A.
Bardsley, Roger E.
Barnette, Warren L., Jr.
Benson, Arthur L.
Berger, Emanuel M.
Berkowitz, Melvin
Bernard, Jack
Bjork, Alton J.
Boory, John F.
Bryan, Robert C.
Buck, Raymond E.
Burack, Benjamin
Chaplin, James P.
Charley, William M.
Chiozza, Joseph P.
Clark, Jerry H.
Conklin, Edmund H.
Corbin, Horace H.
Dahlin, Bernard C.
DeMott, John J., Jr.
Dodds, William H., Jr.
Dreikurs, Eric
DuBois, Donald B.
Duncan, Robert L.
Farber, Isadore E.
Farberow, Norman L.
Feiner, Arthur H.
Fenger, Fred T.
Finney, Ben C.
Fitzgerald, Don Casot
Fox, Richard F.
Froehlich, Clifford P.
Futransky, David L.
Galt, William E.
Geimer, Vincent D.
Gellman, Martin S.
Gibbs, William T.
Gillman, Robert D.
Glaser, Robert
Goodman, Ervin
Goodman, John K.
Goodrich, Joseph W.
Gordon, Philip L.
Gough, Harrison G.
Gresham, William W.
Grice, George R.
Grings, William W.
Haire, Mason J.
Hamborsky, Dwight K.
Hamilton, Charles E.
Harless, Byron E.
Harris, Robert E.
Harris, William E.
Heartsill, Walter C.
Heyns, Roger W.
Hodben, Frank E.
Hudson, George R.
Hufstader, William H.
Irion, Arthur L.
Jensen, Elmo A.
Jernigan, Austin J.
Jerome, Eldon K.
Johnson, George O.
Kandel, Alan D.
Kehoe, John A.
Keil, Jack Payne
Keller, Robert J.
Kirk, Marquis A.
Klapper, Joseph T.
Klebanoff, Seymour G.
Knight, Norton B.
Krugman, Herbert E.
Lane, Robert C.
Lanier, Julien A.
Lassman, Frank M.
Laurito, Angelo F.
Lawrence, Douglas H.
Lehner, George F. J.
Lerner, Joseph S.
Levin, Morton
Levine, Abraham S.
Levine, Robert
Lieberthal, Jerome I.
Linn, Leslie W.
Lubin, Ardie
Mahl, George F.
Matheny, William G.
McReynolds, Paul W.
Meissner, James H.
Menozzi, John
Miller, Robert B.
Mogin, Bert
Mollenkopf, William G.
Muller, Henry J.
Munson, Charles B.
Murphy, Robert E.
Niehaus, Stanley W.
North, Robert D.
Olsen, Raymond

Pasco, Robert C.
Patterson, Cecil H.
Payne, Riner C.
Payne, Robert B.
Philips, Charles L.
Phillips, Ewing L.
Poinc, Arthur E.
Pollard, Richard F.
Pomeroy, Donald S.
Preston, Harley O.
Prinz, Gerald R.
Rahm, Hayden H.
Ramsey, Glenn V.
Redlener, Joe
Robbins, Irving
Rochlin, Isaiah
Rohles, Fred H.
Roney, James G., Jr.
Rosenwald, Alan K.
Royce, Joseph R.
Schapiro, Jack M.
Schmierer, Hyman
Schoenrick, Carlos O.
Schrader, Everett N.
Schwartz, Stanley
Scrivner, Robert L.
Settlage, Paul H.
Shea, Daniel J.
Shimberg, Benjamin
Shlien, John M.
Sincoff, Philip Lee
Smith, Moncrieff H., Jr.
Spencer, Charles M.
Sprow, Allen J.
Standish, William A.
Steinert, John C.
Stevens, Evan R., Jr.
Sullivan, Cornelius D.
Thomas, Francis H.
Thompson, Charles E.
Traeger, Carl
Valin, Sigmund
Webb, Wilse B.
Weinberg, Edward H.
Weiss, Aaron
Whitesell, Jack C.
Wiener, Daniel N.
Wiley, John H.
Willerman, Benjamin
Williams, Malcolm J.
Williams, Meyer
Willmann, John M.
Wilson, Everett E.
Wisely, Harold M.
Woodruff, Joseph L.

B. *Department of Psychology*

The functions of the Department of Psychology may be described as follows:

(1) Research leading to the origination, construction and evaluation of new psychomotor tests for the selection and classification of aviation cadets.

(2) The design, redesign, and production of psychomotor tests that have been approved for use in the Aviation Psychology Program.

(3) Cooperative research with other departments of the Research Section, School of Aviation Medicine, especially in those research problems that involve the use of psychomotor tests.

The design and production of psychomotor tests for use in the classification of aviation cadets in the AAF Training Command has been the responsibility of the Department of Psychology since March 1942. Although not strictly a research function, this activity has occupied the personnel of the Department continuously and on occasion, exclusively. Tests that had been validated in research forms had to be modified for use in a mass testing program, special cycling devices had to be developed for the automatic control of testing intervals and other conditions in order that four aviation cadets could be tested simultaneously by a single examiner, and tests and control devices had to be designed to minimize the differences between different copies of the same test. The Department of Psychology performed these functions and in addition had responsibility for the procurement of the necessary materials and the direct supervision of the production of the tests for use in the AAF Classification Centers. By 1 November 1943 twenty-five "lines" of psychomotor tests, each "line" being composed of four copies of each of six apparatus tests, had been delivered to the AAF Classification Centers, and Basic Training Centers.

No actual testing of aviation cadets has been performed in the Aviation Psychology Program at the School of Aviation Medicine. The School of Aviation Medicine, of which the Department of Psychology is a unit, is under the direct supervision of the Air Surgeon. Psychological research is coordinated through the Research Division of the latter office.

Major (now Lt. Colonel) Arthur W. Melton was commissioned as an Aviation Psychologist and reported for duty at the School of Aviation Medicine in January 1942 and has served as Chief, Department of Psychology, since that time. Three additional officers—Captain Judson S. Brown, Captain Jack Buel, and Lt. Robert M. Gagne—and one Senior Psychologist (Dr. R. B. Loucks) reported during 1942. All of the officers and Dr. Loucks have the Ph.D. in psychology and have had extensive research experience in the development and use of psychological apparatus. In addition, two officers of the Aviation Psychology Program, Captain Roger W. Russell and Lt. Wilbur S. Gregory, served as civilians for a short time in the Department.

II. Rationale of Research

The basic assumption on which the Department of Psychology and PRU No. 2 worked in the development of psychomotor tests was that success in pilot and bombardier training involves to an important degree certain perceptual-motor skills, and that the abilities required for the rapid learning of these skills vary among individuals and can be measured best by psychomotor apparatus tests. When the Air Surgeon was given the mission of establishing a classification testing program in February 1942, it was decided to include several psychomotor tests in the battery for the selection and classification of pilots, bombardiers, and navigators. No preparation had been made to meet the demand for a large number of such apparatus tests and the activities of the Department of Psychology and PRU No. 2 were chiefly concerned during the first eight months of 1942 with the particular problems of a mass psychomotor testing program.

The research program of 1942 was particularly concerned with the immediate adaptation of promising psychomotor tests for use in the mass testing program. To this end a number of tests that had been shown by other research agencies to have some validity for the selection of pilots were purchased or constructed and modified, the modifications being validated at PRU No. 2 against the criterion of success or failure in pilot, bombardier, and navigator training schools. Throughout this period the concern was with conditions of testing such as reliability of scores, instructions, practice and demonstration procedures, time limits, design of equipment to automatize the administration of the tests, scoring methods and apparatus, sources of apparatus variance and examiner variance, optimal size of group to be tested simultaneously by a single examiner, and target sizes. During this period there was also an opportunity to administer tests of a number of different types to large groups of aviation cadets for validation purposes. The majority of such tests were purchased or borrowed from laboratories of psychology, although some were constructed at the School of Aviation Medicine.

After the standardization of psychomotor tests for classification purposes had been accomplished in the Fall of 1942, attention was directed in more concentrated form to the development of new psychomotor tests. It was believed, on the basis of evidence on hand at that time, that the most successful tests would be those which involved relatively complex visual-motor coordination and at the same time involved a heavy weighting of the learning factor. Although it is agreed that too much stress should not be placed on making psychomotor tests duplicate some actual situation or operation in piloting an airplane or sighting a bombsight, it was believed that the most successful tests would be those that were simplified samples of such situations or operations. The majority of the research tests procured or produced and tested for validation purposes during 1943 were tests of visual-motor pursuit functions. Visual-motor pursuit tests had shown promising validity and it was believed that visual-motor pursuit functions should be thoroughly explored as a guide for the development of pursuit tests for the classification battery. In this exploration an attempt was made to obtain or produce pursuit tests that involved both "compensatory" pursuit and "following" pursuit, simultaneous coordination with reference to the movements of from one to four visual objects, simultaneous coordination with reference to a single visual object that would move in one, two or three dimensions, "all or none" vs. graded scoring systems for errors in performance, and various amounts of verisimilitude to the actual task of piloting an airplane.

The next section of this article is devoted to a description of the major tests that have been developed or modified and subjected to validation testing and a later section of this article is devoted to a description of the special techniques for mass psychomotor testing that were developed.

III. Psychomotor Classification Tests

It should be noted in the following discussions dealing with psychomotor apparatus tests that have been tried out experimentally against the criterion of success or failure in training that a number of these devices are adaptations of tests that were extant prior to the Aviation

Psychology Program. Also, several devices recently originated by psychologists have been borrowed or purchased for validation trial at PRU No. 2 and for redesign by the Department of Psychology to adapt them to the requirements of a mass testing program. In general, the policy has been to give experimental trial to any psychomotor test, regardless of its origin, if it seemed to have likelihood of measuring some ability required for aircrew success.

A. *Psychomotor Classification Tests in Use 1 July 1943*

1. *S.A.M. Complex Coordination Test* (*Mashburn*). This test was originally developed in 1934 by Colonel Neely C. Mashburn at the School of Aviation Medicine and has been known as the Mashburn Automatic Serial Action Apparatus (2) and as the Constable Automatic Serial Action Apparatus (7). This test was shown to be valid for the selection of pilots in a report presented by Major C. R. Glenn (now Brigadier General Glenn, Surgeon of the AAF Training Command) in 1935 (1) and in more recent studies accomplished under the auspices of the National Research Council Committee on the Selection and Training of Aircraft Pilots. This test has shown high validity for the selection of pilots in numerous large populations tested in the Army Air Forces during the last two years.

The S.A.M. Complex Coordination Test now in use in the Aviation Psychology Program of the Army Air Forces (Figure 1) is essentially the Mashburn Automatic Serial Action Apparatus with improvements designed to increase the dependability of individual pieces and the uniformity of testing conditions with different copies of the test. The candidate sits in front of three double rows of lights and by manipulating a stick and a rudder causes the apparent position of a green light in each of the three rows to match the apparent position of a red light in each row. When the three green lights have been made to match the three red lights simultaneously for a period of one-half second, a new pattern of red lights appears. The candidate's performance is measured by the number of settings he completes in a specified period of time. The major modifications of this apparatus introduced by the Department of Psychology have been (a) redesign of the mechanical linkage of the stick and rudder to increase its durability and smoothness of operation, (b) substitution of an electronic time-delay relay for a more complicated and less reliable electromagnetic system, and (c) the use of standard replaceable selector switch units.

2. *The S.A.M. Two-Hand Coordination Test.* The S.A.M. Two-Hand Coordination Test is an adaptation of a test purchased from Carl Heinrich who produced it under the supervision of Dr. R. A. McFarland from an earlier model devised by Farmer and Chambers. Studies made under the auspices of the NRC Committee on the Selection of Aircraft Pilots had shown that this test possessed some validity for the selection of successful pilots. Data obtained from the S.A.M. Two-Hand Coordination Test in the Aviation Psychology Program have shown the test to have high validity in the selection of pilots, although not as high as the S.A.M. Complex Coordination Test. It also has some validity for the selection of bombardiers. The test requires the use of both hands simultaneously in manipulating two lathe-type handles to follow a target which moves in an irregular path. The major modifications of the model obtained from Heinrich are (a) the use of a rotating cam to produce a different pattern of movement in the target for each of four one-minute

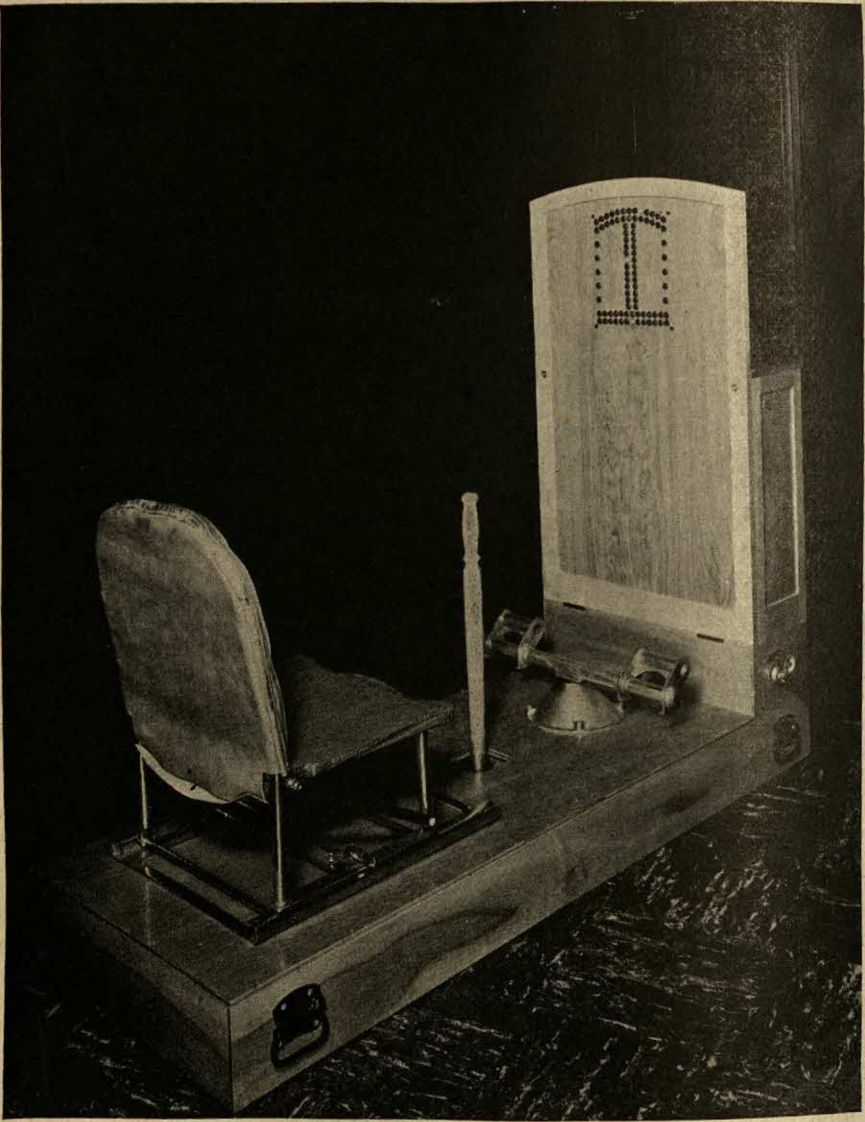

FIGURE 1—S.A.M. COMPLEX COORDINATION TEST

trials, (b) the redesign of mechanical features of the apparatus to permit mass production and increase dependability and reliability, and (c) the introduction of remote controls for the cycling of test trials and remote recording of the candidate's scores on electric stop-clocks.

3. *S.A.M. Rotary Pursuit Test.* This test is an adaptation of the Koerth Pursuit Rotor which has been used for some years in psychological laboratories.

Some evidence of its validity for the selection of civilian pilots was obtained under the auspices of the National Research Council Committee on the Selection and Training of Aircraft Pilots, and since its use in the Aviation Psychology Program its moderate validity for the selection of pilots and bombardiers has been repeatedly demonstrated. The candidate follows with a hinged stylus a target imbedded in a bakelite disc that revolves at 60 rpm. The candidate's score is the total time the stylus is in contact with the target during fifteen 20-second trials which are separated by 10-second rest periods. The modifications of the Rotary Pursuit Test for mass testing purposes are (a) remote control of the cycling of trials and rest periods and remote scoring of performance on electric stop-clocks, and (b) modification of the hinged stylus to enable standardization of pressure of the stylus on the disc.

At the close of the period of this report a discrimination reaction task was being added to the Rotary Pursuit task in order to introduce the factor of division of attention, on the basis of evidence from PRU No. 1 that this addition increased the validity of the test for the prediction of success in pilot training.

4. *S.A.M. Discrimination Reaction Time Test.* This test was produced in quantity by the Department of Psychology and placed in the classification battery before validation data were available. The candidate is required to react to four different relative positions of a red light and a green light by pushing one of four toggle switches arranged in a square pattern before him. The score is the cumulative total reaction time for eighty reactions. The test has shown moderate but consistent validity for the prediction of success in pilot, bombardier, and navigator training. An improved model of the test, in which all presentations of stimuli during demonstration, practice, and test trials are automatic has been produced recently and supplied to all classification units.

5. *S.A.M. Steadiness-Aiming Test.* The Department of Psychology designed and produced in quantity a Steadiness Aiming Test which attempted to measure the same function measured by the Seashore Photoelectric Aiming Test. The candidate attempts to hold the end of a pivoted and hinged stylus in the center of a small hole to avoid contact with the side of the hole. The test was introduced primarily as a medium for the administration of verbal "stress" stimulation devised by PRU No. 1. The test is now known to have no significant validity for the prediction of training success in pilot, bombardier, or navigator schools either with or without the "stress" stimulation and has been replaced in the classification battery.

6. *Santa Ana Finger Dexterity Test.* This test was designed and produced by PRU No. 3, and introduced in the classification battery as a measure of skill in using the fingers. It is now known to have some validity for the selection of bombardiers. The candidate lifts a small peg, rotates it through 180 degrees and returns the peg to its hole. The score is the number of pegs turned in a fixed period of time.

B. *Psychomotor Research Tests* (*February through July 1942*)

During this period the research tests were used as much to study matters of procedure and details of test administration as to determine their validity for predicting success in training. The tests were given to any available aviation cadets, since the cadets were not at that time receiving regular classification psychomotor tests, and each cadet usually took all research tests in use at the time. Pilot models of several of the classification tests mentioned above were administered during this period. Tests listed below were administered for validation purposes largely because of their immediate availability.

1. *Lorge Multiple Discriminator.* This test was borrowed from Dr. Irving Lorge, Teachers College, Columbia University, as a representative of a spatial discrimination reaction time test. Five stimulus lights are above five reaction keys and the score is the cumulative reaction time for response to the key below the lamp which is lighted. The test was not suited for mass testing and it showed relatively low validity for the selection of pilots.

2. *Miles Pursuitmeter.* This test has been available since 1922 (3) and was borrowed from Dr. Walter R. Miles, Yale University. The candidate's task is to keep the hand of a meter centered by use of a slide resistor to compensate for erratic movements of the hand induced by an elaborate current variator. Validity coefficients for this test, based on success and failure in primary pilot training were uniformly low, perhaps as a consequence of the difficulty experienced in maintaining the calibration of the test.

3. *McDougall, Rivers, Farmer Dotting Test.* This test was borrowed from Yale University. The candidate attempts to place a stylus in a series of small holes which pass beneath an aperture at an increasing rate of speed. The form of the test used for this research was not suited for mass testing without extensive redesign, and the low validity of the test for pilot selection dictated against such efforts.

4. *Two-Plate Tapping Test.* This test was borrowed from Dr. Irving Lorge, Teachers College, Columbia University, and it was used primarily to obtain a measure of the work decrement. Neither the total tapping score, nor the work decrement score, had validity for pilot selection.

5. *Judgment-Motility Test.* This test was designed by the Department of Psychology and PRU No. 2 at a time when finger dexterity tests were being sought as potential selectors of bombardiers. In the first part of the test the candidate lifts pegs from holes, judges their length, and places them in certain other holes according to length. In the second part of the test the candidate lifts pegs from the holes and returns them to the first holes according to number. In this way each candidate leaves the test ready for the next candidate. The test was administered as a speed test. This test seemed at first to have substantial validity for pilot selection, but further experimentation has shown the validity coefficient to be insignificant.

6. *Bimanual Coordination Test.* This test was devised by PRU No. 1, and used at PRU No. 2 in order to obtain validation data and intercorrelations with other research psychomotor tests at PRU No. 2. The candidate moves a traveler through a triangular pathway by simultaneous manipulation of two handles. The pathway is notched so that the traveler is obstructed when it moves out of the midline pathway. This test has relatively high validity for the selection of pilots, but its relatively high correlations with the S.A.M. Two-Hand Coordination Test and other psychomotor tests mitigated against its use for classification testing.

C. *Psychomotor Research Tests* (*July 1942 to July 1943*)

During this second period of research testing all tests were administered primarily for validation purposes in a search for new and different psychomotor tests to replace less valid tests in the classification battery. Subjects were tested immediately after they had finished the psychomotor classification battery, as described in Section A above. Each cadet was given only one experimental test so that the contribution of each test to the psychomotor classification battery could be independently evaluated by use of the multiple regression technique.

1. *S.A.M. Steadiness Test.* This test was supplied to PRU No. 2 by the Department of Psychology primarily for use in the classification battery prior to the completion of the S.A.M. Steadiness-Aiming Test described in Section A above. The candidate attempts to hold a small stylus in an aperture without making contact with the side of the aperture and the score is the total time during which contact with the side of the aperture occurs. The test is now known to have no validity for the selection of pilots or bombardiers.

2. *Two-Hand Steadiness Test.* This test was validated on the hypothesis that it required division of attention. Two copies of the S.A.M. Steadiness Test were used for each candidate and the task was to hold a stylus in the apertures with each hand without touching the sides of the apertures. The test was found to have no validity for the selection of pilots.

3. *Smoothness of Coordination Test.* This test was developed by the Department of Psychology in an attempt to measure the smoothness of the control movements of the candidate in the S.A.M. Two-Hand Coordination Test. The essential mechanism is a pendulum impact recorder which is mounted on the target follower of the test. The total number of impact contacts, which is a measure of the jerkiness of movement, is recorded by an electronic counter system. The scores on this test have very low correlation with the scores on the S.A.M. Two-Hand Coordination Test and with other tests in the classification battery. It was found that the test had no validity for the selection of pilots or bombardiers. It is believed that the principle of the test may be applied to test situations involving other types of coordinative movement with more appropriateness and with perhaps some validity for the selection of aircrew personnel.

4. *Two-Hand Pursuit Test (Thurstone).* This test was designed by Dr. L. L. Thurstone, University of Chicago, for the selection of bombardiers. Copies of the test were produced by the Department of Psychology and validation studies were made at PRU No. 2 and at Ellington Army Air Field. Using the mechanism of the S.A.M. Two-Hand Coordination Test, the candidate attempts to keep a rotating target in the center of a viewing piece which contains a reticle. The candidate is not aware of the fact that the target is moving in a circle since his own movements interfere with the regularity of the apparent motion of the target. This test has been shown to have moderate validity for the selection of pilots and for the selection of bombardiers, but its high correlation with S.A.M. Two-Hand Coordination Test mitigated against its adoption for classification purposes.

5. *S.A.M. Visual Coincidence Reaction Time Test.* The Department of Psychology designed and produced a number of copies of this test in an effort to produce a selection test for low altitude bombardiers. The test was never validated for low altitude bombardiers, but has shown moderate validity for the selection of precision bombardiers. It has no validity for the selection of pilots. The candidate's task is to operate a toggle switch at the instant when a moving bar of light passes between a pair of fixed bars of light, all light being

transmitted through a convex translucent screen. The speed of the moving light and the position of the fixed lights were automatically varied from trial to trial. The "all or none" scoring method on this test resulted in relatively low reliability of scores and further modifications are being made in the test.

6. *Action Potential Index.* Tenseness during flight has been indicated in field studies as a reason for elimination from pilot training. As a preliminary to an attempt to measure muscular tension by a simple method suitable for mass testing, a technique for measuring action potentials in the arm of a candidate who is performing on the S.A.M. Multidimensional Pursuit Test (see Figure 2) was developed and administered to a large group of candidates. Validation data are being awaited.

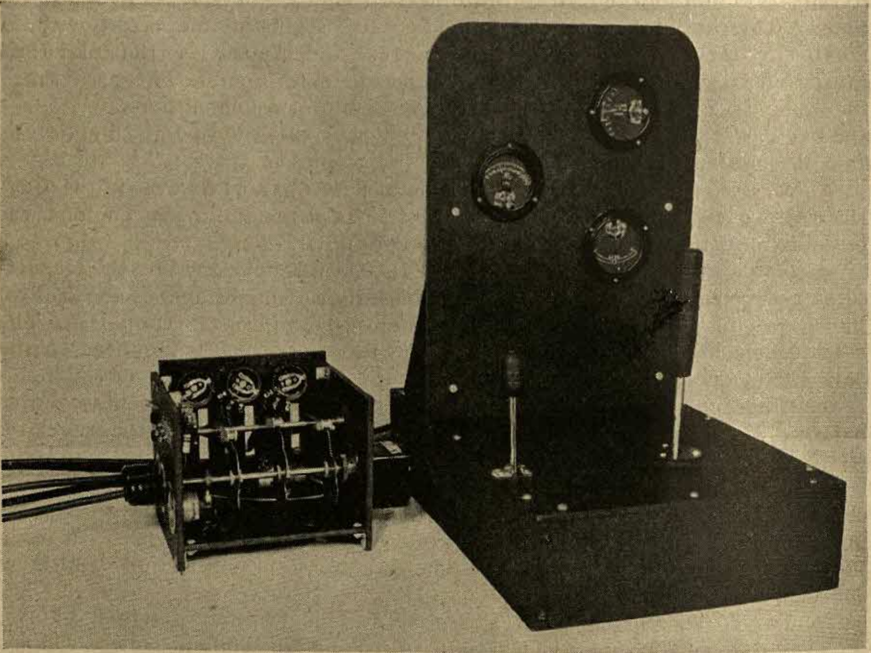

FIGURE 2—S.A.M. MULTIDIMENSIONAL PURSUIT TEST, TABLE MODEL

7. *Single Dimension Pursuitmeter.* This test was developed by the Department of Psychology as representative of the simplest form of compensatory pursuitmeter, the task being similar to that of the Miles Pursuitmeter but the mechanism being suitable for mass testing. The candidate moves a wheel, resembling an airplane control, in and out of its shaft in order to hold a horizontal bar in the center of a circular aperture. The position of the bar in the vertical plane is irregularly disturbed by a cam. Validation data are awaited.

8. *Artificial Horizon Pursuitmeter.* This test was developed by the Mechanical Research Laboratory, School of Aviation Medicine, and was validated at PRU No. 2 as representative of two-dimensional compensatory pursuitmeter. The candidate moves a wheel resembling an airplane control in and out on its shaft and rotates it in order to hold a horizontal bar in the center of a circular

aperture and in a horizontal position. The position of the bar in the vertical plane and its deviation from the horizontal plane is irregularly disturbed by cams. Validation data are awaited.

9. *S.A.M. Multidimensional Pursuit Test, Table Model.* This test (Figure 2) was developed as representative of a complex compensatory pursuit test in which movement in three visual objects must be compensated for by movements of a "stick" and "throttle." The candidate attempts to keep the needles of three meters at a zero position by manipulation of the "stick" (in two dimensions) and "throttle" controls while voltage variators disturb the position of the needles in an irregularly manner. This test samples not only eye-hand coordination but also the capacity to attend to a variety of tasks at the same time. Validation data are awaited.

10. *S.A.M. Multidimensional Pursuit Test.* This test is similar to the Multidimensional Pursuit Test, Table Model, described above, except that the candidate must compensate for the movement of the needles in four meters and employs a "rudder" in addition to the "stick" and "throttle." Validation data are awaited.

11. *Stevens Pursuitmeter.* This test was developed by Dr. S. S. Stevens, Harvard University and purchased by the Department of Psychology for modification and validation testing at PRU No. 2. The candidate manipulates a "stick" and "rudder" in order to keep a spot of light in the center of an oscilloscope screen and a needle at a central position on a meter. The task involves, therefore, some division of attention between visual objects, but, it is believed, not as much as is involved in the S.A.M. Multidimensional Pursuit Test. Validation data are awaited.

12. *Electronic Pilot Pursuit Test.* This test was developed by the Electronic Supply Company, Worcester, Massachusetts, and purchased after extensive modifications under the direction of the Department of Psychology. A moving boom carries two photo-cells which must be spanned simultaneously by a bar of light which is controlled by a "stick" and "rudder." The photo-cells move in a vertical direction, a horizontal direction, and also around the axis of the boom. This test differs from all the pursuit tests previously described in that it involves a "following" pursuit function rather than a "compensatory" pursuit function. Validation data are awaited.

13. *Tridimensional Airplane Pursuit Test.* This test was developed by Dr. R. H. Seashore and loaned to the Department of Psychology for use in producing a pilot model of a form of the test adapted to mass production and mass testing. A model airplane rotates on its vertical, horizontal and longitudinal axes in an irregular manner as determined by a set of cams. The task of the candidate is to keep the plane in a straight and level position by manipulating a "stick" and "rudder" control. The School of Aviation Medicine's model of this test has not yet been administered for validation purposes.

IV. DEVELOPMENT OF SPECIAL TECHNIQUES FOR MASS PSYCHOMOTOR TESTING

Starting with relatively unstandardized pieces of laboratory equipment as original test models, a variety of problems in apparatus design and construction and in testing conditions is being met in developing satisfactory procedures for the daily administration of standard tests to thousands of aircrew candidates at different stations throughout the country. Those concerning apparatus have been almost entirely handled by the Department of Psychology, while PRU No. 2 has been concerned with conditions of testing. However, all Units and many individuals in the Aviation Psychology Program have contributed to the solution of these problems.

A. It was first determined to construct all classification tests in units of four pieces of test apparatus and one central control unit. It was found from early investigation that one examiner could give instructions, record scores, and proctor the testing of four subjects at one time. Fewer or larger numbers of subjects in one test room resulted in inefficient use of personnel.

B. Preliminary testing indicated that an adequate behavior sample, yielding satisfactory reliability of measurements, could be obtained for each of the classification tests in thirteen minutes of over-all testing time, of which about one-third is spent in instructions, demonstrations and practice, and the remaining time in testing for the record. Two minutes are allowed for movement between test rooms. Later studies have shown that the validity of the present classification tests is not increased when longer tests are given. The control mechanisms developed by the Department of Psychology administer the tests so that they automatically keep up to this schedule.

C. All control equipment has been designed to yield maximum automaticity of operation, so that the test examiner is left free to proctor and to record scores accurately. An essential principle has been the consolidation of all control switches and scoring devices on a control desk.

D. In the choice of apparatus designs and parts at least two important considerations have governed. (1) Ruggedness of construction has been essential in order for equipment to withstand continuous daily use. The substitution of castings for pieced framework, and of gears and sprockets for cables and friction discs are typical examples. (2) Procurement difficulties have often made it necessary to choose standard mechanical and electrical parts in terms of their availability with the priorities obtainable rather than in terms of ideal characteristics.

E. Problems of maintenance in the field have been met in two ways: (1) the use, wherever possible, of instantaneously replaceable and interchangeable components of apparatus; and (2) the preparation of schedules for regular preventive maintenance check-ups and standardized instructions for necessary repairs in the field. These have been prepared by the Department of Psychology on the basis of maintenance records from PRU No. 2 and other units.

F. The development of adequate standard instructions for each test has been a major concern of PRU No. 2. Studies were made of the frequency of misunderstandings of instructions by candidates. Instructions have been successively revised and tabular studies again made until maladaptations as a function of inadequate instructions or demonstrations have been reduced to a minimum. Examiners have consistently been required to repeat all instructions verbatim from memory, to give demonstrations only in a prescribed manner, and to answer candidates' questions in standard fashion. A comprehensive system of psychomotor examiner training and systematic checking has been developed. Analysis of variance studies have shown that variance attributable to the test examiner has become insignificant.

G. Extensive analysis of variance studies have shown that variance related to the apparatus on which the subject is tested is highly significant, even though pieces of apparatus have been produced by commercial firms with precision mass production methods from models and complete drawings. Until more accurate machining and more intensive calibration procedures are accomplished, it is necessary to control these differences statistically. As routine practice all scores obtained on each piece of apparatus are tabulated, means and standard deviations for successive groups are computed, and conversion tables are revised whenever means or variabilities of scores consistently show significant deviations.

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A BLINKER ADAPTATION OF THURSTONE'S 1943 CODE APTITUDE TEST

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This report* is the outcome of a request by Lt. Commander Charles H. Bowman, commanding officer of the Naval Training Schools at the University of Illinois, for assistance in selecting or devising a test that would enable the Signal School to predict the probable success of its trainees. Approximately 25 per cent of an average class fail to pass the 16 weeks' training period in the Signal School due to inaptness. This figure is somewhat below that reported by Taylor (3), who states that from 30 to 60 per cent of unselected men who begin code study in commercial and military schools fail to become proficient operators. Without adequate selection, therefore, considerable instructor and student time are lost in the attempt to train the potential failures. Our problem was to select or devise a test that would differentiate those who are more likely from those who are less likely to be successful in the Signal School.

Trainees at the Navy Signal School are required to learn semaphore and flag hoist signaling as well as Morse code using blinker lights. Preliminary investigation of the conditions under which the men are trained and the difficulties they encounter, in so far as they were known to the instructors, revealed that the most difficult task is to learn to receive the blinker code signals. It was therefore decided to investigate this aspect of the problem first.

The speed at which blinker code signals must be received for successful completion of the 16 weeks' course is slower than that for auditory code signals. Blinker trainees who are unable to receive at a rate of at least seven words of five characters each per minute are bilged (failed). Trainees who are able to receive at a rate faster than this but less than

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* Numerous people have aided us in this project. Lt. Russell I. Damon, Executive Officer of the school, has given extensively of his time and assistance. Without Lt. Damon's aid, the work could not have been carried on successfully. Lt. C. G. Browne, former Personnel Officer of the Navy Signal School offered frequent advice and considerable assistance throughout the early stages of the work. Mr. Albert James Ebel, Chief Engineer of Radio Station WILL, designed the dual selective amplifier described in a succeeding article. He also gave considerable time to the cutting of the test records. Chief Petty Officer Frank A. Simmons of the Navy Signal School worked with us for several months, both in the manual administrations of the test and in cutting of the records. Earlier manual presentations were given with the help of Signalman Second Class Morris Vorenberg. Miss Alberta Menzel of the staff of Radio Station WILL read the instructions for the recordings. Professor Herbert Woodrow has given us encouragement and financial support throughout the project. Since the test reported here is but a blinker modification of Professor L. L. Thurstone's Code Aptitude Test, our indebtedness to him is apparent.

ten words per minute are graduated as Seaman First or Second Class, while those who are able to receive at a rate faster than ten words per minute are given the higher rating of Signalman Third Class. The problem, therefore, can be more precisely stated as being the selecting or devising of a test that would differentiate those trainees who have the possibility of learning to receive the blinker code signals at a rate of at least 35 characters per minute from those who do not.

We have been unable to locate any published report of a visually presented code aptitude test. Both Army and Navy have been using Thurstone's 1919 autitory rhythm test (4) which consists of a series of code letters and code letter groups presented auditorially in pairs which the subjects are to identify as the "same" or "different." Thurstone (5) reported recently on a work sample test having considerably higher reliability and validity than the rhythm test alone.* Since there probably is a fairly high correlation between an auditorially and a visually presented test, one possibility would be to make direct use of Thurstone's new test. However, by presenting a work sample test using the regular blinker signal lights it is possible to approximate more closely the conditions the trainees face during their training period as well as when on board ship. Further, some instructors report that they have had more difficulty training men to receive blinker signals when they have had previous auditory code experience than in training those with no previous code experience at all.

For these reasons, our first attempt consisted in modifying Thurstone's work sample test by presenting the code signals visually. The second edition of Thurstone's work sample test (6) consisted of 14 subtests, namely: 1) an auditory rhythm test; 2) letter D; 3) letter R; 4) letters D, R; 5) letter U; 6) letters DU and RU; 7) letters D, R, and U; 8) letter S; 9) letters D, R, U, and S; 10) auditory distractors with letters D, R, U, and S; 11) recognition of letter D, R, U, or S interspersed among other signals; 12) auditory number span; 13) auditory rapid spelling; and 14) dot discrimination similar to the rhythm test. Discussions with code instructors indicated that the last fifteen items of the auditory rhythm test probably would be too difficult when presented visually, so these items were omitted. Since the maximum speed for blinker work is only about 17 words per minute with the receiver working with a partner, there seemed to be little need for the rapid spelling test. Since the modified test was to be presented visually, the auditory memory span subtest was likewise dropped.

Inasmuch as the trainees in the testing situation would have to write their own responses, and since they could not write effectively while looking at the blinker lights, it was necessary to allow them more time between test items than in the auditory situation. After some preliminary study, the intervals between test items were set at from three to five seconds, depending on the number of letters in each item that the subject had to record. This interval was found to be long enough to enable them to record their responses, but not long enough for them to become bored.

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* Since this project was started, D. W. Taylor reports a similar test and concludes that "an Initial Learning Test seems to be the most promising test yet developed for use in the selection of men for training in code." *Learning Telegraphic Code. Psychol. Bull.*, 1943, 40 (July).

In the interference subtest both visual and auditory distractors were used in the first administration. The interferences consisted of 1) a man walking across the stage platform, 2) a ruler clapping on the floor, 3) two men conversing, 4) the overhead stage lights turning on and off at an irregular rate, and 5) the footlights flashing on and off at an irregular rate.

A few other minor changes had to be made. All instructions referring to auditory functions, such as "listen," were changed to visual terminology, such as "watch" and "look."

Test Situation. In the test situation, two blinker signal lights were located about four feet apart on a table in the center of the stage in the testing room. These blinker lights are ship's lanterns which hang four and one-half feet apart on a yardarm during training. Each light contains three or four type T7 Hygrade, 120 volts, 15 watt bulbs. Surrounding the bulbs is a magnifying lens. The code operator was stationed in a wing, as far from the trainees as possible, in order to minimize the sound of the telegraph key. The instructions were read by the junior author from a position on the stage intermediate to the blinker lights and the code operator.

Subjects. Of the men in the first class studied at the Naval Training School (Signal) at the University of Illinois, only 92.0%* were available on March 29 to take the first manually presented modified form of Thurstone's second experimental test before their training period began. This 92% group will be considered to be the entire experimental group.

Since the purpose of this experimental administration was to determine the differentiating power of each subtest as well as of the test as a whole for future groups of trainees, the representativeness of the class studied is an important consideration. The relevant data that were available for the members of this class and for those in the earlier classes with which this class was compared, include average age, average schooling, average scores on the general classification test, average scores on Thurstone's 1919 auditory rhythm test, the first, second, and third choices of specialization within the Navy, and the percentage of those who failed from the Navy Signal School. However, since no measures of scatter were kept for the first classes, only crude comparisons could be made between the first classes and the class studied. For the most part, the mean scores for the two groups are not markedly dissimilar. Insofar as the mean scores are concerned, therefore, the members of this class were considered as typical of the trainees at the Navy Signal School.

Scoring. Each subtest was separately scored for errors, the scoring facilitated by the use of stencils. A unit error was defined as a failure to respond or an incorrect letter whether that letter appeared alone or as part of a group of letters forming the test item.

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* At the request of the Navy, all figures are given in terms of percentage of the total group studied.

Distribution of Errors. Error distribution curves of each of the subtests were drawn. Inspection of these graphs revealed that on three of the subtests there were many perfect scores and few errors by any trainee. These subtests—the second, third, and fifth—are primarily training exercises involving recognition of the position of the signal for letter D, R, or U when it was interspersed with two other signals. The distributions indicate that these three subtests could have very little discrimination value and the scores on them were therefore disregarded. This reduced the number of subtests included in the total score to nine. Table 1 shows the distribution of the error scores on the test as a whole, each score being the sum of the errors on the nine subtests. The least number of errors is four, the highest number 536, and the median 74.5.

TABLE 1

DISTRIBUTION OF ERRORS IN TERMS OF PERCENTAGE OF TRAINEES IN EACH CLASS INTERVAL, BASED ON SUM OF NINE SUBTESTS

Class Interval	Per cent
0– 30	13.0
31– 60	26.8
61– 90	21.6
91–120	10.2
121–150	11.5
151–180	7.7
181–210	3.7
211–240	2.0
241–270	1.5
271–300	0.0
301–330	1.0
331–360	0.5
....	
511–540	0.5
Total	100.0

Validity. The administration and the manual scoring time of this test were considerable. It was desirable to reduce either or both without lowering the validity or reliability. With a view toward eliminating those subtests with low validity, validity coefficients were determined for each subtest. The criterion first used was continuance in or bilging from the training school after the first six weeks period. This particular period was chosen because it was the time at which the first group of bilgees was dropped. This criterion necessitated the use of bi-serial or tetrachoric correlational procedures. Inasmuch as both time and clerical help were limited, tetrachoric correlations only were determined (2). The resulting correlations are included in Table 2.

TABLE 2

VALIDITY COEFFICIENTS (TETRACHORIC) OF EACH SUBTEST AND OF TOTAL TEST WITH CONTINUANCE IN, OR BILGING FROM CLASS AS CRITERION

Subtest	Validity Coefficient after 6 weeks	 after 12 weeks	 after 16 weeks
Rhythm	.48		
Letters D & R	.53		
Letters D, R, U	.48		
Letters D, R, U, S	.76		
Interference	.68		
Letter Recognition	.23		
Letters DU & RU	.35		
Letter S	.33		
Dot Signals	.40		
Total, Nine Tests	.73	.54	.46
Total, First Six Tests	.68	.59	.51
Per cent of trainees in each group	100	93.3	93.3

The subtests with lowest validity are letter recognition, letter S, letters DU–RU, and dot discrimination, in the order named. It was decided to drop the scoring for letter S and letter DU–RU but to retain them in the administration of the test since both give training for later, more differentiating subtests. Both the dot discrimination and the letter recognition tests might be eliminated entirely. Since the dot discrimination test is somewhat similar to the rhythm subtest, the decision was made, more or less arbitrarily, to disregard the scores on this subtest and to drop it from future administrations. The decision to retain the letter recognition test was also more or less arbitrary, and cannot be completely justified at present.

Omitting scoring of the subtests for letter S, letters DU–RU, and dropping the dot discrimination subtest, reduces the number of subtests to be scored to six. Error scores for the total of these six subtests were then calculated. The median error score is then 56.8. The least number of errors is three and the largest number is 293.

The validity of the blinker code aptitude test, based on six subtests, and calculated in the same manner as for the several subtests, gives coefficients of .68 at the end of the six weeks period, .59 at the end of the 12 weeks period, and .51 at the close of the training period. Comparable figures for the nine subtests gives .73, .54, and .46 respectively. Comparing these values with those for six subtest, indicates that little or nothing has been lost by the exclusion of three subtests.

As noted in Table 2, N varies from 100% of trainees tested for the first six weeks to 93.3% for the twelfth week. After the six weeks period, 6.7% of the men were discharged from the class studied for various reasons: to return to Coast Guard units, to enter V-12 training program, for sickness, and for discipline. Since these trainees left for reasons other than inaptness in code, they cannot be considered as being successful or as having bilged.

Of the trainees who were not transferred out of the school, 20.1% reported that they had had some code training of one kind or another prior to the time of the test. Since this previous training may influence the validity coefficients unduly, the records of these men were withdrawn and tetrachoric coefficients calculated for those who did not report having had code training. The validity coefficients, based on the sum of the scores for the six subtests for the trainees who did not report having previous code training is .51, while on the basis of nine subtests it is .52.

As stated earlier, the precise purpose of this experiment was to select or devise a code aptitude test that would differentiate those who could learn to receive blinker code signals from those who could not do so, under the training procedures at the Navy Signal School. The criterion of continuing in and graduating from versus bilging out of the Navy Signal School involves other factors than learning to receive blinker signals. A more appropriate criterion would describe more accurately the effectiveness of the test. One such criterion is the class performance while learning to receive blinker signals as graded by the instructors. Accordingly, the final blinker grade in the course was used as a validating measure. This final blinker grade is equally dependent upon the weekly averages and upon a final qualifying examination, both weekly grades and final examination grade being determined by instructors. For men who bilged out, the average weekly grade up to the time of bilging was used, since this included all the data that was available. Tetrachoric correlations between the average class performance grade thus determined, and the code aptitude test, for both six and nine subtests, using all available trainees, are .64. When only those trainees who did not report prior code training are included, the validity coefficient (tetrachoric), with average class performance as the criterion, for the six subtests is .66.

A validity coefficient that high clearly indicates that the test is a useful one for the purpose of selecting blinker signalmen.

The validity coefficients for each subtest, with average blinker grade as the criterion are as follows: rhythm .43; letters D & R, .64; letters D, R, U, .61; letters D, R, U, S, .63; interference, .54; letter recognition, .42; letters DU & RU, .48; letter S, .27; dot signals, .52. These coefficients give further evidence for the justification for including in the final scoring subtests D & R, DRU, DRUS, and the interference subtest. They also give additional evidence for not scoring subtests S and DU & RU. There is some question as to whether the rhythm or the dot discrimination subtests ought to have been retained, and the question can even be raised as to whether both might not be dropped in the effort to cut down the administration time. Unless further evidence to the contrary is obtained, the letter recognition subtest might also be dropped entirely. These possibilities will be considered when data on the recorded edition of the test is available.

A method other than the correlational procedure to show the validity of the test is to indicate, in a distribution curve, the scores of the bilgees. This has been done in Figure 1. Error scores in class intervals of ten for the sum of the six subtests selected are indicated on the abscissa and the frequency of the scores on the ordinate. The total graph area includes 93.3% of the men tested. The areas with diagonal lines represent those who bilged at the end of the six weeks period, the areas with vertical lines those who bilged between the seventh and twelfth weeks, and the horizontal lines those who failed between the thirteenth and sixteenth weeks.

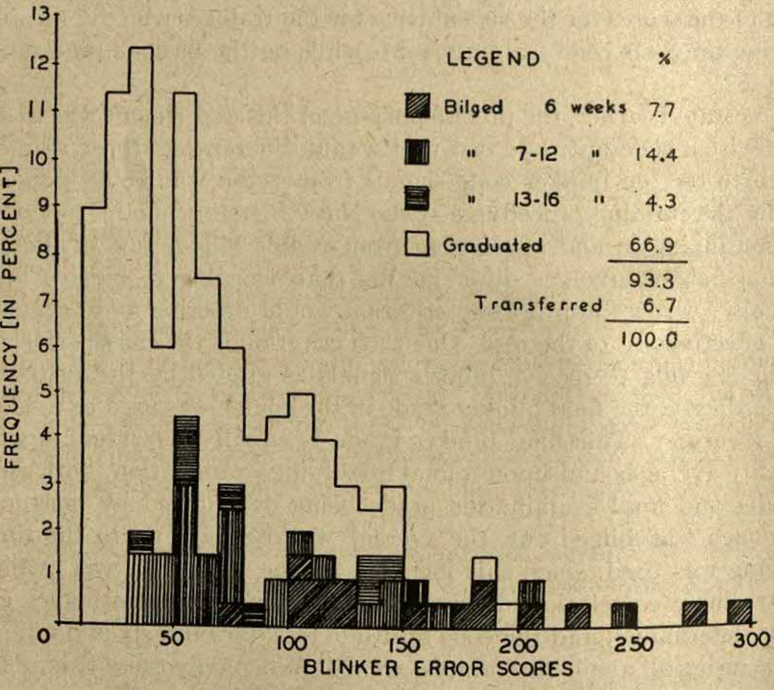

FIGURE 1—DISTRIBUTION OF ERROR SCORES ON BLINKER CODE APTITUDE TEST (SIX SUBTESTS). FIRST CLASS STUDIED

There is a third method by which the validity of the test might be indicated. This method, for the present purposes, may be of greater practical value than either the correlational procedure or the graphic technique. This method would be to show the percentage of failures among those who were not transferred for other reasons who had test scores in the lowest five per cent, using the sum of the six subtests selected, how many in the lowest ten per cent, etc. The results in terms of the per cent of trainees who bilge below various centile levels is as follows:

Below centile 5,	80%
Below centile 10,	75%
Below centile 15,	67%
Below centile 20,	60%
Below centile 30,	50%
Below centile 35,	47%
Below centile 45,	43%
Below centile 65,	40%

It is not the function of this report to determine a critical test score below which men might well be excluded from the Navy Signal School. If we can assume that this class is representative of future classes, then those men who score in the lowest 5% have only 1 chance in 5 of graduating; those in the lowest 10%, have 1 chance in 4 of graduating; those in the lowest 30% have 1 chance in 2. On the other hand, those who have scores in the highest 25% are almost certain to be successful. If some critical score were to be established, and the test administered at induction centers, considerable time, money, and effort could be saved.

Reliability. The reliability of each subtest and of the test as a whole was determined by means of the split-half method, making use of the Spearman-Brown estimation formula. The estimated reliabilities thus obtained for each subtest and for the test as a whole are:

Rhythm	.79
Letters D, R	.69
Letters D, R, U	.90
Letters D, R, U, S	.92
Interference	.94
Letter recognition	.73
Total of Six Subtests	.97

While test-retest reliabilities probably would be more accurate, and give somewhat lower values, those obtained are so high that there can be little question that the consistency of the test as a whole is very high.

Additional data from second class studied. Since the preparation of this report, additional data on the validity of the blinker code aptitude test was obtained from a second class. Ninety-seven and one-half per cent of the men in this class took the test in April. At the end of the training period only seven per cent had failed, indicating that this class was considerably superior to most classes.

The distribution of the summed errors on the six subtests selected for scoring for the second class studied is given in Figure 2. These subtests are the first six listed in Table 2. The disposition of the trainees after their 16 weeks of training is also indicated therein. The men who bilged are signified by diagonal shading, Seaman Second Class by vertical lines, Seaman First Class by horizontal lines, and Signalman Third Class by blank spaces. Median error scores for the men in each of these

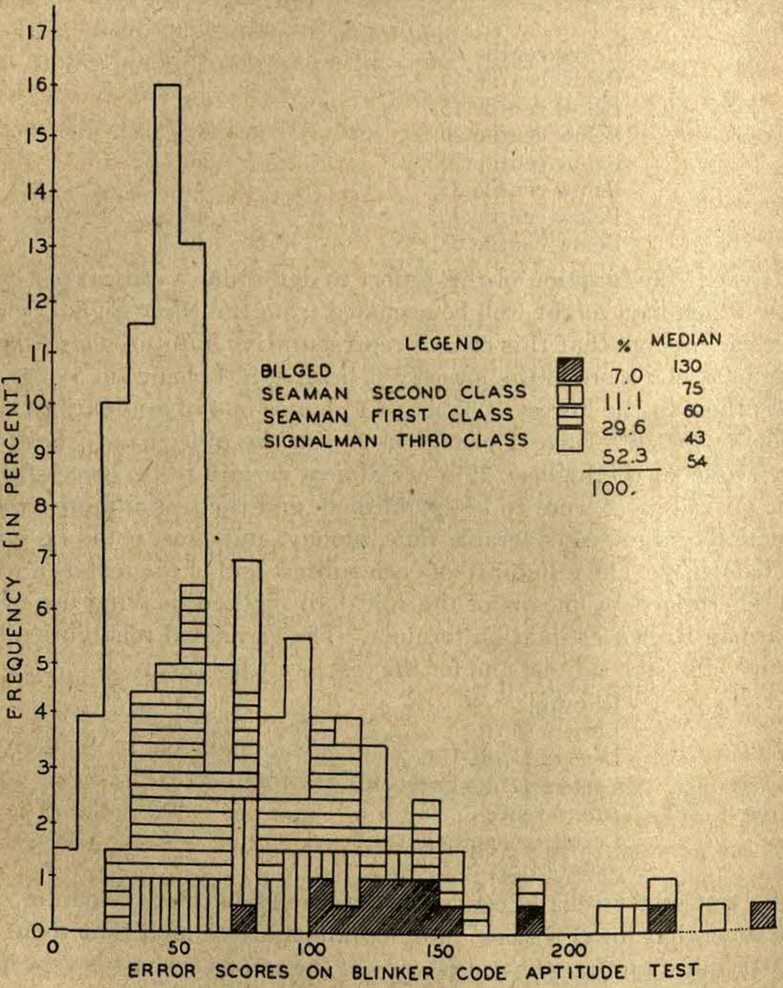

Figure 2—Distribution of Errors and Disposition of Trainees After 16 Weeks of Training. Second Class Studied.

four classifications are 130, 75, 60, and 43 respectively. While there is considerable overlapping in error scores between the men in these classifications, the median error scores indicate clearly that the test has considerable differentiating power. If a critical score of 100 had been adopted, eliminating from signal training some 22 per cent of those sent to the Navy Signal School, all but one of the failures would have been excluded immediately.

The validity of the test, using the data for the second class and tetrachoric correlational procedures, with graduating-bilging as the criterion, is approximately .65. This value, however, should not be given much weight, since its determination had to be made with the division of the criterion near the tail of the distribution. With final blinker code grades as the criterion, the validity coefficient is .63. In this case the division of both distributions was made near the median scores and this value can be given considerable weight. Inasmuch as these values are similar to those reported for the first class, they substantiate the high validity already reported.

Recorded edition of the blinker code aptitude test. On the basis of data obtained in the administration of the test to groups of trainees in March, April, May, and June, and with a view toward reducing the time consumed in administration, certain modifications have been made in the test as first administered in March. With these modifications, test records were cut in July to be used in conjunction with a dual selective amplifier (1). The first experimental recorded edition of the test include the following subtest: 1) rhythm test; 2) letter D; 3) letter R; 4) letters D, R; 5) letter U; 6) letters DU and RU; 7) letters D, R, and U; 8) letter S; 9) letters D, R, U, and S; 10) auditory distractors with letters D, R, U, and S; and 11) letter recognition. Of these, numbers 2, 3, 5, 6, and 8 are not scored. By means of the phonograph records, the test was first presented in July to another class of men in a more standardized manner than is possible by manual means. A follow-up of this group will be reported when data are available.

Summary. An experimental blinker modification of Thurstone's 1943 code aptitude test has been administered to two classes at the Naval Training School (Signal) at the University of Illinois. The test has been demonstrated to have both high validity and reliability, thereby showing that it can be a useful device for the prediction of success and failure in the learning of the blinker code.

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The author states in his introduction that it is his purpose "in the following pages to show that the dynamic concepts of inner needs, holistic adaptation, equated or symbolic expression, and motivational conflicts—concepts derived from psychoanalytic theory—can be broadened and profitably applied to the experimental investigation of animal as well as human behavior."

A first series of experiments on cats studied the role of the hypothalamus in emotion. By direct stimulation through a bipolar needle electrode the symptoms of sham rage were produced. This was distinguished from "true affective states" by being irrelevant to the external situation, failing to persist when the stimulus was discontinued, and several other criteria. This sham rage could not be conditioned to light, sound or air-blasts in many trials. Though the author points out that the behavior is initiated by the direct stimulation of efferent systems, his own interpretation is not that association must involve afferent or connector systems, but rather that sham-rage lacks motivational connotation or "meaning" and therefore can neither be conditioned nor made the basis for an experimental neurosis (58).

A second group of experiments dealt with a conditioned feeding response, using a light flash and bell as the signal of the manual or automatic delivery of food to a food-box in a cage. These experiments should be of particular interest to psychologists not only because they are well observed and well described, but because Masserman has not fallen into the prevalent stultifying practice of observing and recording only totals and averages of many trials. He is more interested in learning than in learning curves, and, when the returns justify it, gives a play by play account which throws light on the nature of learning which is entirely lacking in most reports of maze-running or of long series of conditioning trials.

The use of a switch-lever which operated the flash and bell signals was learned by the cats under various circumstances. Masserman notes the use of different methods for raising the lid of the food-box or for depressing the lever. "Cats which learned to depress the switch with the paw (61) generally used that motion thereafter; those which learned by accidentally rubbing against the switch continued to rub against it, usually with the head, occasionally with other parts of the body . . . ." There were some cats which displayed eagerness to get into the experimental cage and resistance to being removed. The description of results is used to point up Masserman's contention that the Pavlovian conception of the reflex misses much significant behavior which he believes can be understood only in terms of desire, motive, need, sign gestalt, etc.

In these experiments in conditioning barring the passage to the food-box did not bring about neurotic changes. "External frustration" in general produced adaptive extinction of the response. But results were very different when "the goal-seeking behavior . . . was made conflictful by the elicitation of opposing motivations within the animal itself." This was achieved by subjecting the cat either to an air-blast or to a grid shock at the moment of feeding. In response to the air-blast, animals usually rushed to crouch at the far side of the cage. In response to shock, animals gave a startled jump and then with slow dignity stalked away from the food after the shock had ended. In some instances only one such experience was enough to produce in the cat severe neurotic symptoms. Food signals "which formerly had occasioned an immediate rush to the food-box, now induced crouching, hiding, vigorous attempts to escape from the apparatus, rapid and irregular pulse and respiration, trembling, and other behavior suggestive of marked anxiety or even panic (68)." In most animals these phobic reactions persisted almost unchanged for months without further reinforcement by shock or blast (68).

Certain animals developed "counterphobic" patterns, stereotyped mannerisms which constituted a defensive adaptation by reducing tension. Regressive behavior in the form of "self-preoccupation" and "autistic indulgence" (cleaning and licking) are interpreted by the author as substitute satisfaction for the frustrated drives.

The neurotic symptoms were in general increased when hunger was intensified. They were also increased by pushing the animal toward the food-box, especially immediately after feeding signals. This produced symptoms of extreme claustrophobia and uncontrollable panic.

Rest left the abnormal behavior unchanged in 37 animals; in seven it produced some amelioration. Positive therapeutic measures, however, were found to be distinctly effective. These included feeding the animal manually or even forcibly, just before placing it in the cage. The suggested explanation is that one of the conflicting motives had been reduced.

In other animals, handling, stroking and petting gradually enabled the animal to resume feeding at the signal, but this was often stopped when the stroking was discontinued.

In still other animals the intensification of hunger reestablished eating in spite of conflict, and this initiated the reduction of the conflict. Hunger could not be intensified through starvation because animals would go for from eight to twenty-two days without eating though food was available in the food-box. The intensification was brought about by the use of the sight or smell of food, or by the use of sensory stimuli associated with satisfactory feeding or by forcing the cat into closer proximity to the food.

Another "therapeutic" measure consisted in placing a normal cat in the cage with the neurotic animal. This had in a few cases a slight effect toward restoring normal behavior in the neurotic.

A most interesting final therapeutic measure was to train the animal in advance to depress a switch which actuated the signals for reward. This switch was for a time severely avoided after the blast or shock; but such animals tended generally to resume the use of the switch and to manipulate it with increasing confidence until they had reestablished their feeding routine. This method was the most effective of all the measures.

Following the accounts of his experiments is an extended survey of the literature on conditioning and neuroses, collected as evidence of the author's contention that the concepts of association and Pavlovian conditioning are inadequate for the description of such behavior. He himself offers four "fundamental principles of behavior."

1. Behavior is motivated by the biologic needs of the organism.
2. Behavior is contingent upon, and adaptive, to the *meanings* of the "objective" and social environment as interpreted by the individual organism.
3. Behavior relieves bodily tensions not only by direct, but also by *substitutive* or *symbolic*, activity.
4. When psychobiologic motivations or environmental meanings become excessively confused or conflictful, behavior correspondingly becomes abnormally indecisive, sub-

stitutive, diffusely symbolic, and biologically inefficient, i.e., "neurotic" or "psychotic" in expression.

Carmichael, in a delightful introduction to a recent *Bulletin* article on the "Experimental Embryology of Mind" asks at what point the fertilized ovum, until then the creature of physics and chemistry, is supposed to become independent of its origins and acquires a soul and is ruled by its destiny. The answer is, of course, that your real vitalist objects to explanations in terms of proximate cause at any point. Even the sperm and ovum are moving on toward their destinies.

Many psychologists that the author of this book would class as mechanists can sympathize heartily with his objections to the crude notions of Pavlov's reflexology and the uncritical acceptance of those notions by some American experimenters. But he would find if he actually made the attempt, which he has surely never done, that many of his own reported facts take very kindly to description in terms of the circumstances leading up to rather than the result led toward. There is no conflict between final cause and proximate cause. The same event may be given both descriptions. "Mechanists" do not deny meaning and purpose in the world. They are attempting to describe meaningful and purposeful behavior in terms of the circumstances under which it occurs, instead of in terms of its expected outcome.

EDWIN R. GUTHRIE

University of Washington

JONES, HAROLD E. Development in adolescence. New York: D. Appleton-Century Company, 1943. Pp. xii+166.

This book is a report of observations and measurements made on a boy and his environment from his tenth to his eighteenth year of life. The case, alias John Sanders, is one selected from the 200-odd subjects of the California Adolescent Growth Study as exhibiting a variety of problems of adjustment and is presented "as a teaching vehicle—to illustrate method and to present specific growth phenomena concretely rather than abstractly." The data concerning the case were collected by the Institute Staff at intervals over a seven year period.

The method of presenting the growth phenomena is difficult to describe. It is not biographical in the strict sense of being undisciplined artistry; yet there is presented the social setting and, to some extent, the stream of life in which the case developed. The reader at times becomes engrossed with cultural factors: general rather than specific effects of home conditions, school clubs, unattainable ambitions created by our society, and the like. The chapters are somewhat like a number of short stories appearing in one volume; some sequent, some not. The author states that the book treats "specific modes of expression of a total growth process."

One gets a general picture of John Sanders and his environment from the first two chapters. The boy grew up in a section of a city interstitial to the industrial and the better residential districts. Therein he and his associates were neither very well-to-do nor extremely poor. Most of his time was spent close at home under the continual supervision and dominance of his mother. He became a docile, well trained child who gave little trouble. This docile attitude was carried with him to elementary school where he made little impression on either teachers or pupils. After graduating from a local elementary school, he transferred to a junior high school to become enmeshed in a crowded institution composed of children from socio-economic groups both above and below his own. John rather retained his stay-at-home role and so made few friends with his classmates and none with his teachers. He did become interested in the social activities provided at the Adolescent Growth Study Clubhouse and spent all available time there. He joined the Boy Scouts wherein his role was one of doing the hard work but not one of gaining positions of honor. Upon graduating from junior high school he entered a senior high which was twice as large and which had a wider variety of social make-up. He did not possess the requirements of the social clubs and so had little to do in running either the school or the social life of the students. As a substitute, he participated in clubhouse activities, joined a current events club, and remained a Boy Scout until in the twelfth grade he dropped it for the Y.M.C.A. He was regarded as a queer fellow by most students and as a poor college prospect by most teachers.

Views of special features of John are given in Chapters III through IX. The different features selected for view with the sources of information are presented in different chapters, usually against a group background. These include: academic and social attributes; health, and physical and physiological changes; strength and motor abilities; intelligence, achievement, and motor, verbal, and rational learning abilities; interests and attitudes; needs and drives; and self-evaluations.

Interrelationships of different features of John are discussed in the final chapter. Special stress is placed on the relation of changing physical characteristics to difficulties encountered in social, economic, and general environmental situations. Many of the social difficulties seemed to have a core in John's physical weakness and retarded maturational status. Improvement in adjustment coincided with his final physical maturation and with changes in the group itself as its aspirations became more sober.

The author achieved his aim of presenting specific aspects of growth phenomena concretely and did so in an interesting fashion. The effect of this achievement on various readers and hence its over-all contribution to psychology should be considered. The reviewer is of the opinion that a layman or a novice in psychology will accept the account as either fact or fancy depending upon whether he is already inclined toward determinism or magic. It is improbable that the book would induce him to ask questions or formulate hypotheses as would the trained person when considering single cases. This brings up the more fundamental question of the treatment in psychology of the unique case. The traditional approach which seeks laws or principles regarding the operation of processes is skeptical of it as the apparent relationship between various features is not subject to empirical verification. The dominant mother, for example, appeared as an adverse influence on John Sanders, but one can wonder how many dominant mothers have brought up dominant sons. So can one question the seeming effects on development of the various cultural factors mentioned. The very fact that such questions do arise, however, gives the book its value.

JOHN B. WOLFE

University of Mississippi

Bills, A. G. The Psychology of Efficiency. New York: Harper & Bros., 1943. Pp. xiv+361.

This book brings together information from various sources, as it applies to adjustment from the point of view of efficiency. It deliberately avoids emphasis upon the emotional aspects of behavior; it goes beyond the management point of view by being concerned with the "mental worker himself who would like to know how to accomplish the most with the least wear and tear and the greatest long-time satisfaction to himself." The chief topics covered, in 18 chapters, include: the thinking process; the nature of, measurement of, and recovery from, fatigue; sleep; attention and distraction; the relation of suggestion, learning, motivation, physical conditions, etc., to work efficiency; self-analysis and improvement of work procedures.

It is difficult to determine whether the book is intended as a textbook, as a reference book for professional psychologists, or as guidance for the layman. The language is sometimes that used in the "bend-down" type of popularizing (e.g., frequent use of a body-machine analogy, emotions discussed as "friction," rules for "lubricating" personal human relationships), yet there is probably too much technical material for easy reading by a layman. On the other hand, much of the writing is not precise enough for professional training or reference use. The latter point may be illustrated in several ways. For example, such ambiguous terms as 'tense mental attitude' are employed. There are rather literal physiological treatments of phenomena which are as yet in the realm of constructs (brain energy levels in Ch. II; mental blocks in Ch. IV). There is some uncritical borrowing of terms, as in the relating of creative inspiration and 'Lewin's principle of closure' (68). Again, there are rather unfruitful verbal distinctions between external and internal facilitating or inhibiting influences (Ch. II), and between sustaining and energizing motives (pp. 170 ff.).

Three more general criticisms may be raised. First, much in this book depends on the concept of set. It is given definition and mention in several places, but in view of the emphasis on it, a thorough treatment of it might have been appropriate. Second, because of the nature of the style of writing, rather sweeping generalizations are made, as when it is stated that reading and recitation should be employed in a 1 to 4 ratio for efficient learning (239). This statement probably is based on Gates' experiment, which simply does not show this for meaningful material, or for a wide range of conditions. Third, the author points out the close inter-relations of 'mental' and 'physical' fatigue in the first chapter, but thereafter body and mind tend to be independent entities.

At the risk of being unfair to Professor Bills, it may be said that some passages in the book are rather hard to swallow. For example, in a discussion of personality improvement where he is concerned with tastes in reading, music, and art (298) he says:

> The widespread American attitude has long been to reject the best in favor of the popular, on the ground that red-blooded masculinity has no place for refining influences. The defect in popular music is that it depicts such a limited range of moods and thoughts. The lament of the lone cowboy has its place, but a little of it goes a long way. Such music requires little exercise of the nervous system above the spinal cord, and leaves no residue of developed mental muscles, no sense of achieving. . . .

In another instance, having reported that efficiency rises during the work week to a peak on Wednesday, he recommends, with professorial calm, Thursday is the natural point at which to introduce a half-day rest . . . we herewith advocate that all workers, particularly mental workers, adopt such a plan. Housemaids already observe the Thursday half holiday; why not office workers, industrial workers, business men, and students? (222).

The above criticisms are concerned mainly with form—credit should be given for the effort to bring together in a meaningful way the diversity of studies which pertain to efficiency at work. The book does not leave the reader with the feeling that he has been exposed to a fresh point of view, but this may not be possible until more of the data on efficiency in the work of war are available.

CLAUDE E. BUXTON

University of Iowa

WHITNEY, DAVID D. Family treasures, a popular guide to heredity. Lancaster, Pennsylvania, Jacques Cattell Press, 1943. Pp. 299.

Here is a popular introduction to knowledge about human heredity, written by a zoologist of recognized ability. The author has made numerous important contributions to research in genetics. His book is intentionally factual, it is restricted to presentation of data acceptable to scientists, and it attempts to educate readers against acceptance of prevalent discredited ideas. Emphasizing the inheritance of normal human traits, it gives a clear idea of the meaning of such traits through unusually extensive photographic material.

In the family history technique used in this study of heredity, the compilation consists largely of photographic records showing the inherited characteristics of members of families traced through two to five generations. This material is supplemented by reference to the available published studies, thus placing the photographic data in the general research literature, and lending balance and perspective to the whole.

Evidence concerning about 200 traits is presented. These include such characteristics as obesity, hair color and form, stature, characteristics of the blood, eye-color and form, shape and size of nose, and many details of the hands, feet, trunk, head, and face. Some space is given to unusual characteristics such as albinism, hemophilia, and brachydactyly, but abnormal traits are not emphasized. The photographic method appears to be very effective in giving precise meaning to the trait-names. Probably the weakest chapter in the book is that dealing with temperament. Here the discussion is much less sophisticated than one might expect in view of the extensive work of modern psychologists who have written about temperament and personality. However, in the other, more important parts of the book, Whitney has succeeded in clarifying the meaning of many concepts dealt with in genetics. Such basic ideas as dominance, recessiveness, sex linkage, multiple determiners, and hybridism are effectively exposed.

The book may be used by teachers in developing a general readiness for college courses in genetics. It will interest many individuals who have observed but not understood the significance of traits which run in their families. Anyone interested in the details of personal identification will enjoy the chapters dealing with inherited characteristics of the hands, feet, head, face, eyes, mouth, etc. For example, psychologists interested in the diagnosis of monozygosity in twins will find much useful data. Since details of physique are probably more noticeable to persons who have studied them intensively, it seems likely also that the book could be used to advantage in modern schools for police officers.

The obviously sketchy nature of much of the data, perhaps emphasized by the method of presentation, calls attention to the need for more research of an organized sort in the field of human heredity. This too is a part of the author's intention. Whitney has been successful in all of his major purposes, for the book is sound, interesting, simple but instructive, and likely to stimulate further data collection. It is written for amateurs; it is likely to lead some of them into professional work in genetics.

HAROLD D. CARTER

University of California

BRECKENRIDGE, MARIAN E., & VINCENT E. LEE. Child development: physical and psychological growth through the school years. Philadelphia: W. B. Saunders, 1943. Pp. ix+592.

For some time there has been a need, which this book helps to supply, for a good textbook on the development of school-age children. In this instance the collaboration of a nutritionist and a psychologist has resulted in a book which deals in some measure with every aspect of the growth of children. The authors say that the book "is designed for professional students in psychology, teacher training, home economics, medicine, nursing and social work as well as for parents." This is a large order. Although it is pretty well filled for the various professional workers, sections of the book are probably too advanced and the language too technical for many parents.

Copious use is made of current research findings: often both sides of controversial issues are presented. Care is taken to state whether or not a point is substantiated by adequate research. The authors quote freely from many sources. The bibliography of 806 titles is an indication of the thoroughness with which they have covered the fields of research in child development. Of necessity the discussion of some topics is brief, but all are well-documented. Suggestions for practical applications are given for each topic discussed, with specific attention often being called to practical methods in the school and in the home. At the end of each chapter are "Questions for Class Study" and references for "Selected Readings".

The organization of the material departs notably from the traditional arrangements in child psychology texts. There is a strong emphasis on the interrelatedness of the various aspects of development. This interrelatedness is given precedence in the chapter arrangements, Chapter I being on "General Principles of Development" and Chapter II on "Interrelatedness of Growth." In this latter chapter considerable use is made of Olson's concepts of organismic age. The following four chapters are concerned with "Influences on Growth." These are grouped into: "Heredity, Endocrines, Illnesses, Emotions," "Nutrition and Routines," "Home, School, Church and Camps," and "Further Community Factors." After all of these discussions of interrelatedness and influences, the authors turn in the next six chapters to the consideration of growth itself, in physical, motor, various mental and intellectual, and personality trends. (Intelligence is treated incidentally under "Sense Perceptions and Judgments.") There are two additional chapters on "Social and Personality Development," the latter discussing in some detail "Moral Judgment and Psycho-sexual Development." The final chapter summarizes the general trends of growth and gives case studies of two typical children.

This organization of the material is well calculated to emphasize the growth of the child as a whole. However it may operate to make the book too difficult for persons who have not had preliminary work in some part of the field. A person who is trained in any one area of child development should find this book excellent for general orientation to the whole field. It should be a good text for an advanced course, and an excellent source for references to recent research and writings on growing children.

NANCY BAYLEY

University of California

TOMKINS, S. S. (Ed.) Contemporary psychopathology. A source book. Harvard University Press, 1943, Pp. 600.

This book is a collection of 45 condensations of researches in the field of abnormal psychology, for the most part published within the last 5 years. It is divided into four sections: seven papers are on mental diseases in childhood, 10 on psychoneuroses and psychosomatic medicine, 13 on the schizophrenic psychoses, and 15 on experimental psychopathology.

The studies have been well edited. They are presented in sufficient detail to allow the discriminating reader to recognize the obvious merits or limitations of experimental design and procedure. In the individual investigations, the papers have been presented in clear and concise form, are easily understood and may be read rapidly after mastery of the technical terminology frequently used.

At least six of the seven papers on mental diseases in childhood are written from a psychoanalytical point of view. Not all of the papers enjoy such a standard of excellence as to justify this over emphasis. The dangers of coercive and threatening behavior in the development of the infant and young child are emphasized in the well-formulated studies by Huschka. The uses and limitations of release therapy in treatment of the emotional problems of the young infant are clearly presented by Levy.

All reported clinical investigations dealing with psychosomatic medicine are studies carried out at the Chicago Institute for Psychoanalysis. These workers have attempted to relate gastrointestinal, asthmatic and vasomotor disturbances to basic personality types produced by varied predominant conflict-situations. That there is a relationship between certain "organic" disorders and prolonged unconscious emotional conflicts seems to be well established. The identification of a particular disorder with a particular predominant conflict situation is yet to be conclusively demonstrated, and there is general agreement that further research is needed.

An extremely interesting paper on the experimental production and control of peptic ulcer in a man with a gastric fistula is presented by Wolf and Wolf. A statistical study by Dunn points out and attempts to explain the high incidence of gastroduodenal disorders among (English) soldiers during this war. Late in the section a paper by Rosenzweig deals with the importance of implicit common factors in diverse methods of psychotherapy. The discussion of diverse methods comes as a surprise since, in the clinical articles chosen, there was no indication that there was more than one method used successfully in the treatment of psychoneurotic disorders.

In the section on the schizophrenic psychoses the first two papers describe the existence of physiological changes in the bodily economy associated with this psychotic disorder.

Shiply and Kant review and discuss the relative merits of insulin-shock treatments in cases of schizophrenia. The "bleaching of affective life" by frontal lobotomy is described by Freeman and Watts. According to the data presented by the authors, the poorest results are obtained in cases of schizophrenia.

Three papers dealing with thinking disorders in schizophrenia are presented. There is general agreement that there is a loss or reduction in the categorical attitude of the patient, and a lack of internal intellectual organization. Differences in the thinking processes of schizophrenic patients, of normal children, and of senile patients are emphasized by Cameron.

Three experimental psychopathological studies on the rat indicate that early frustrations subsequently may produce inhibition of function, hoarding, or regression, as the case may be.

Gantt recommends change of environment for neurotic dogs.

Four papers on hypnosis point out the usefulness of hypnosis as an experimental technique in the analysis of psychopathological phenomena. Papers by Haggard, by Murray, and by Sears present experimental evidence of the influence of emotions and of basic personality mechanisms on varied behavioral tests. The articles by Haggard and by Sears have therapeutic implications. The importance of threat in conflict and frustration and its importance in animal and human experiments is emphasized by Maslow.

The book is described in the introduction as "not a textbook in itself but the auxiliary of a textbook." It will serve this purpose admirably in the field of abnormal psychology and many of the abstracted articles could well be used as collateral reading in courses dealing with emotions, motivations, social psychology or clinical psychology. The value of the book is perhaps enhanced by the fact that the student with little statistical training will have no difficulty in comprehension.

HARRY F. HARLOW

University of Wisconsin

FERNALD, GRACE M. Remedial Techniques in Basic School Subjects. New York: McGraw-Hill Book Company, 1943. Pp. xv+349.

Dr. Fernald is primarily a psychologist both by training and interest. It is the psychological aspects of her techniques which make them valuable aids to the education of children who have difficulty in mastering the basic school subjects. She is an able clinician and appreciates the emotional distress suffered by all children who fail to make normal progress in school. Her major contribution is in demonstrating how this emotional blocking, which so often interferes with further learning once a child has failed, can be overcome.

Though many children fail to learn to read under the conditions of the ordinary classroom in the public schools, genuine and incurable alexia has been found to be very rare—limited to a few cases with demonstrable brain lesions. Dr. Fernald works from the premise that all other children, assuming that they are well and of normal intelligence, can be taught to read by employing a suitable method.

The Fernald method of remedial instruction, which has been briefly described in several previous publications, differs from other methods in drawing heavily upon auditory and kinesthetic functions. Each word to be learned is first written by the teacher and then pronounced naturally for the child. The child traces the written copy of the word with finger contact while saying the word until he feels that he has mastered it. Next he writes the word from memory on a slip of paper which he files for future reference, and writes the word again in the composition for which he needs it. His composition is typed in correct form by the teacher and constitutes the material for his first reading. No copying is allowed, and no child is ever forced to write a word that he does not feel he knows. This procedure minimizes the practice of errors. Since words of any length or difficulty can be learned by this method, an older child can write about things that interest him and which are in keeping with his mental age.

The Fernald method differs rather markedly from the methods of teaching reading commonly used in the schools of today. The value of this fact in gaining the child's cooperation should not be underestimated. He is asked to try a new way of learning words which many boys who have had difficulty in learning to read have found successful. He sees other boys and girls like himself at the Clinic School obviously making progress. He tries the method and finds that it *is* different. Moreover, his ability to learn by its use is immediately demonstrated to him. Just as in the case of a new medical treatment, the novelty of the approach has tremendous worth in gaining the enthusiastic cooperation of the patient.

The general procedures at the Clinic School are not entirely original but are psychologically sound. Children are first given something to do which they know they can do. The need for reading and writing develops out of this situation. By reference to carefully gathered case history material, it is possible to avoid reinforcement of negative emotional conditioning due to past failures. Once the child has begun to learn, his progress is demonstrated to him as the best possible motivation for further effort. The group instruction available at the Clinic School has an advantage that cannot be matched by the best of individual teaching. Each child enters a smoothly functioning group of children, all of whom have difficulties similar to his own, and all of whom are using the same method he is requested to try. The group situation gives rise to social imitation, provides companionship with other children, and furnishes opportunities for cooperation and competition. Children are not returned to their regular classes until they have enough skill in reading to keep pace with other children of their own ages, and until all subject matter deficiencies have been made up. Unfortunate behavior reactions due to feelings of inadequacy are thus eliminated at their source.

The phenomenal success of the kinesthetic-auditory method described in this book will appear to many to be an overstatement of the facts. It should be remembered that Dr. Fernald does not imply that her method is the only method by which these children could have learned. She does demonstrate with carefully kept records that the children and adults who have come to her, already having failed by use of various other methods, did learn with relative ease and permanence by use of the kinesthetic method. The underlying psychological question has yet to be answered: are there intrinsic differences in sensory functioning and mental organization which account for the failure of certain individuals to learn by some methods? Or, is it largely incidental which method or combination of methods are a part of the total situation in which a child succeeds or fails? More specifically, are there some children for whom auditory, kinesthetic, or primarily visual methods are essential? As a result of her experience, Dr. Fernald is inclined to feel that there are differences in brain functioning which account for non-readers and cases of partial disability. If this is true it should be possible to measure these differences, thus preventing failure by the use of the correct approach to each child in the beginning. On the other hand, if learning is found to depend on the total situation rather than on any particular approach, the general psychological introduction of children to the basic school subjects, so ably described in this book, is of the utmost importance.

Several chapters are devoted to applications of the method to mentally retarded children, to the teaching of beginning classes (with careful follow-up study of each child), and to incorporation of the method into the regular procedures of the public schools at any level. Included also are discussions of the application of the method to the teaching of spelling, and of remedial work in arithmetic. The organization of the content could have been improved, thereby eliminating a great deal of unnecessary repetition. The book is attractively set up and generously illustrated with pictures of children engaging in various phases of the remedial instruction, and with photostatic copies of their work. Tables supply details of the progress of individual children. A well selected bibliography of several hundred titles has been appended.

KATHARINE M. MAURER

University of Minnesota

NOTES AND NEWS

The University of Pennsylvania has set up a Personnel Index, a new unit through which alumni now in the armed forces will be assisted in obtaining employment after the war. The service will be conducted on a basis of cooperation between the university and the War Department, the National Roster of Scientific Personnel, and the War Manpower Commission. Clarence E. Clewell, director of the placement service is director of the service. Assisting him is an advisory committee composed of administrative officers and professors, among whom is Robert A. Brotemarkle, professor of psychology.

Margaret D. Gordy, director of placement, Wilson College (Chambersburg, Pa.), has been commissioned to make a six-month survey of tests and their use in occupational adjustment. The study is designed to help the students and alumnae of the college in planning postwar careers.

P. S. de Q. Cabot has resigned as assistant professor of psychology at Simmons College to accept the position of Director of Personnel Research in the United Drug Co., Inc., Boston. He remains as consultant and Research Associate for the Ella Lyman Cabot Foundation. He has recently completed a confidential war emergency assignment in Washington.

Earle E. Emme, chairman of psychology and guidance, and director of the downtown division at Morningside College, was recently elected Dean of Dakota Wesleyan University, and professor of education and psychology. Dr. Emme was completing his tenth year at Morningside. He began his new duties at Dakota Wesleyan on March 1.

Wilson College (Chambersburg, Pa.), announces the promotion of Mrs. Edward E. Anderson to an assistant professorship in psychology.

Goodrich C. White, president Emory University (Ga.), has been appointed by the Association of American Colleges as one of the association's "three representatives to the American Council on Education."

Seth Arsenian, professor of psychology, Springfield (Mass.) College, was granted a leave of absence in December for service as head of the Near Eastern section of the Foreign Broadcast Intelligence Service, FCC, Washington, D. C.

Frank A. Beach, chairman and curator of the department of animal behavior at the American Museum of Natural History, addressed members of the faculty and graduate students of the departments of zoology and psychology at Indiana University on February 7. His lecture was entitled "The Neural and Hormonal Factors Involved in Reproductive Behavior."

Christian A. Ruckmick, now connected with the North Western Railroad spoke on Thursday, February 24, at the Milwaukee State Teachers College on the topic "Controlling Your Emotions." Dr. Ruckmick is a member of the Committee on Techniques and of the Committee on Standards of the Chicago Office of Civilian Defense.

The Michael Reese Hospital announces its 1944 course in the Rorschach test to be conducted by S. J. Beck. The emphasis this year will bear especially on the test insofar as it indicates expectation of success in treatment. The dates are June 5–9, inclusive; two sessions daily, two hours each session. Information may be obtained from the Department of Neuropsychiatry, Michael Reese Hospital, 2815 Ellis Avenue, Chicago 16, Illinois.

Psychological Cinema Register. The Psychological Cinema Register, formerly operated by Adelbert Ford of Lehigh University, has been purchased by The Pennsylvania State College, State College, Pa. The sale of the films listed in the September, 1941, edition of the Register, which was suspended in

December, 1941, will be resumed immediately. The editorial supervision of the Register will be carried on by the Department of Education and Psychology of The Pennsylvania State College. EDWARD B. VAN ORMER, associate professor of psychology, will serve as editor with the assistance of other members of the department and such other specialists as may seem desirable. The business management of the Register will be in charge of I. C. BOERLIN, supervisor of Audio-Visual Aids Services of the Central Extension Division of The Pennsylvania State College, under whose direction the College maintains a rental library of educational films and other audio-visual aids, a projection service for both campus and extension classes, and a 16 mm. sound motion picture production unit. C. R. CARPENTER, associate professor of psychology at Pennsylvania State and now on leave as a Captain in the Army Air Forces, and chairman of the APA committee on Audio-Visual Aids, will be an advisory editor. In taking over this distribution of instructional films in psychology and related fields, The Pennsylvania State College wishes to be of service in the instructional phases of psychology, psychiatry, and related professions. It plans to make the more popular films available gradually on a rental basis, thus being of service to smaller institutions who cannot afford the convenience of purchasing films. The new editor and manager solicit the continued interest of the psychological, medical, and psychiatric professions in the Register and will welcome suggestions for increasing and improving its service. Communications regarding the submission of new films should be addressed to the *Editor*, EDWARD B. VAN ORMER, The Psychological Cinema Register, Audio-Visual Aids Library, The Pennsylvania State College, State College, Pa. Communications regarding purchase of films and possible rentals should be addressed to the *Manager*, I. C. BOERLIN, at the same address.

Announcement of Senior Internships. Announcement is made of two senior internships (residencies) in psychology open in September, 1944, at the Western State Psychiatric Hospital in affiliation with the Department of Psychology of the University of Pittsburgh under the immediate direction of DR. SAUL ROSENZWEIG. The positions are intended for advanced training in clinical psychology, broadly conceived to include the fields of psychological tests, counselling and experimental psychopathology. Men or women who have a Master's degree in psychology and some clinical experience, and who wish to study for the Doctor's degree are eligible. At the hospital, the candidate will receive advanced training in clinical procedures and carry on research toward the doctoral thesis; at the University, graduate courses for the Doctor's degree will be taken. Full maintenance at the Hospital, including board, room and laundry, is provided in addition to a cash stipend of approximately $75 a month. University courses may be taken at half-rate tuition ($5 per semester credit). Appointments will be made for one year subject to renewal if requirements have been adequately met. Applications should be addressed to DR. GROSVENOR B. PEARSON, Director, Western State Psychiatric Hospital, Pittsburgh 13, Pa.

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Psychological Bulletin

THE PREPARATION OF ARTICLES FOR PUBLICATION IN THE JOURNALS OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION*

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INTRODUCTION

The American Psychological Association publishes seven professional journals. The success of these journals and the value of their contribution to the science and profession depend upon the cooperation between the authors and the editors in the improvement of the manuscripts presented for publication. It is the purpose of this paper to discuss these relations and to make a series of recommendations which, it is hoped, will be a positive aid in handling the endless detail that must go into the preparation of a paper. The editors feel that there is a need for a summary of this kind in view of their policy of encouraging contributions from the younger members of the profession, many of whom are writing for publication for the first time. Although the editorial staff of each journal gives careful consideration and substantial time to each manuscript submitted for publication, time, energy and money can be saved if authors will give more attention to the preparation of their manuscripts and will consult past issues of the journal to which they wish to submit an article.

The journals of the American Psychological Association are administered by a Board of Editors, which is responsible for general editorial policy in accordance with the provisions of Article X of the By-Laws and by the Council of Directors, which is responsible for the business management. Article X states, "It shall be the duty of each editor to conduct his journal in conformity with the general policies outlined by the Board of Editors. The decision of an individual editor as to the selection or rejection of manuscripts submitted by him shall be final."

Since each journal published by the Association covers a different field and serves different objectives, prospective authors should consult past issues of the journals for guidance regarding the type of articles accepted or correspond with the editor before submitting an article. The following paragraphs characterize the fields covered by each journal:

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* The preparation of this article as a guide to authors in preparing and typing manuscripts was authorized by the Board of Editors on April 11, 1943. A preliminary copy of the article was circulated among the editors. In the main, their suggestions have been incorporated in the final copy. It should be recognized, however, that there is some divergence in style from journal to journal and that editors are free to solve the problems that arise within their own particular publications.

Psychological Abstracts, which appears monthly, devotes twelve numbers and an Index Supplement to the publication of non-critical abstracts of the world literature in psychology. The abstracts are prepared by a group of abstractors and translators in each field upon invitation from the editor. Unless an abstractor has had an area assigned to him by advance arrangement there is little likelihood that his voluntary contribution will meet the rigorous technical requirements observed in the preparation of this material.

The *Psychological Bulletin*, which appears ten times during the year, contains critical and analytical summaries of the psychological literature in all its phases as well as book reviews,* notes and news and various official papers and the Proceedings of the American Psychological Association and its affiliated societies. The editor is in constant need of current announcements for the News and Notes section but reserves final judgment of their news value.

The *Psychological Review*, which appears bimonthly, publishes original contributions, chiefly of a theoretical and integrative nature. Many people, misled by the name, send lengthy book reviews to the editor of the *Review* which actually publishes no book reviews.

The *Journal of Experimental Psychology*, a monthly journal, publishes original contributions which are experimental in their nature.

The *Journal of Abnormal and Social Psychology*, a quarterly publication, devotes its attention to original contributions, book reviews, and notes in the fields of abnormal, social and clinical psychology (**1**).

The *Journal of Applied Psychology*, issued six times a year, publishes original contributions, book reviews and notes dealing with the application of psychology to such fields as business, industry and education.

The *Psychological Monographs* consists of longer original research and laboratory studies which appear as units. Single numbers vary in size and are gathered into volumes of about 350 pages. This mode of publication requires extensive correspondence not only with respect to editorial content, but also with regard to business arrangements.

The book reviews published by the *Bulletin*, the *Journal of Abnormal and Social Psychology*, and the *Journal of Applied Psychology*, are assigned to persons who indicate their willingness to serve in this capacity. Each editor keeps a file of competent persons and their areas of interest. If a person feels that he would like to review books he should write to the editor concerned letting him know of this willingness and giving the fields in which he wishes to prepare reviews. A commitment of this kind involves certain responsibilities on the part of the reviewer, among which promptness is important.

An article offered for editorial consideration should be significant for the audience of professional psychologists reached by the Association's publications. It should define its problem or area clearly, and reach legitimate conclusions. Clarity of expression, uniformity of citation and completeness of reference are essential in a satisfactory manuscript.

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* An article on "The Preparation of Book Reviews," was published in the *Psychol. Bull.*, 1943, **40**, 423–426 (**3**).

EDITORIAL POLICIES

Selection of manuscripts. The most important task faced by any editor is that of the selection of manuscripts for publication. All the criteria used cannot be stated in advance, as they vary somewhat from one journal to another. One of the most important factors affecting selection, common to all journals, is the amount of space available. Each journal has a certain number of pages to be filled annually. If three times as many manuscripts are received as there is space available, two out of every three must be rejected on this basis alone, without regard to their quality. It should also be evident that a well-prepared typescript cannot help but impress the editor and increase the chances that a manuscript will be selected.

Time lag. The time lag in the publication in the APA journals ordinarily varies from six to twelve months. Editors make every effort to keep the lag under a year, and generally wish to reduce it to some satisfactory minimum. Some lag is desirable. With a supply of manuscripts available in advance, the editor can make very much better adjustments, both as to editorial handling of the manuscript and space arrangements.

Order of publication. Manuscripts are usually published in order of their receipt. When a manuscript is received, the date of its receipt or of its final acceptance in case a major revision is necessary, is entered upon it and an acknowledgement is sent to the author. This date determines the order of publication, even though the editor returns the paper for minor revisions and corrections. There are certain exceptions to this practice as follows:

(1) Manuscripts for special numbers which have been solicited by the editor or a contributing editor assigned to that number are scheduled for a particular issue, without regard to the date of receipt of the manuscripts.

(2) Sometimes a short manuscript which rounds out the quota of pages available for a particular issue is printed out of the time order. In such matching of pages, editors follow the order of receipt as nearly as possible.

(3) Occasionally an article is received that is of such immediate interest and timeliness for the profession that it is given priority.

(4) Sometimes an author wishes prompt and prior publication and is willing to pay the complete cost of composition in order to ensure such publication. In such a case, the number of pages for the year is increased by the corresponding amount, and scheduled articles are printed in their regular turn and space. Since practice with regard to advance publication varies among the journals, authors interested are urged to consult the editor of the particular journal. For the time being, articles are not being accepted on the prior publication basis because of the paper shortage.

Cost of publication. Publishing scientific and scholarly contributions is an expensive procedure—principally for two reasons: their circulation is extremely limited and the cost of tables, graphs, and formulae is disproportionately high for the amount of space they occupy. For this reason, the Association requires authors to pay one-half of the composition costs for tabular matter and cuts regardless of the length of the article or the amount of such material. The Association pays the other half of the composition costs for material of this sort. Although the exact charges cannot be anticipated, experience has shown that to publish one full page of tables usually costs the author approximately $3.00. If a table is only one-half page long, then the cost to the author would be $1.50. Two half-page tables at different places in the text will cost no more than if they appeared on a single page. Formulae cost at about the same rate as that for tables and, again, may be distributed over several pages at the same rate as though they occupied a single page. To publish a full-page line cut, made from a black and white drawing, usually costs the author approximately $2.00. Several small cuts, even though they occupy one page, cost proportionately more unless a single plate can be made. Drawings furnished with manuscripts frequently are not suitable for publication due to technical requirements. If a drawing has to be done over, the author is charged the full cost of the changes made.

Cost of alterations. It is the policy of the psychological journals to charge authors one-half the cost of any alterations made in the galley proof. These charges mount very rapidly if there is an extensive series of changes because resetting costs from 10 to 15 cents for each line. The hourly rate paid by the Association to a printer is $2.50 for making corrections in the galley proof—more, we are afraid, than many of our authors earn per hour. If a change is essential, authors should count the number of characters and spaces and make an insertion or change that will use the same number of characters and spaces, since any change in the length of a line by insertion or deletion may involve resetting eight to ten lines at a cost of a dollar or more for a single correction. The author, however, does not pay for printer's errors.

For this reason, a printer slavishly follows the copy which is furnished to him. At times the author is much irritated because the printer has not corrected what seems to him to be a very obvious error, but much of what printers set seems meaningless to them, a comment that is not intended to reflect on the competence of the linotype operator. The word "ahistorical" is a case in point. This word is not in any standard dictionary and it appears to be a typographical error in which an "n" has been omitted and the space bar gone untouched—but if a printer corrected it he would be wrong. Multiply these examples indefinitely and one can understand why a printer will set "The odor restaurant," if that's what the copy says. The author is annoyed because the dumb printer didn't see that "Theodor" was intended.

Reprint orders. Some confusion arises in editorial and printing offices with regard to orders for reprints. It is the policy of the psychological publications to allow authors of articles which run *nine* pages or more in length, 50 reprints without covers, without any charge. For articles less than nine pages and for more than 50 reprints of articles of nine pages or more, extra charges are made in accordance with a table that comes with the reprint order. Since galley proof runs about three pages to the galley, an article must fill at least three galleys to make nine printed pages. As it is customary to run reprints at a convenient time after the journal has been printed, some delay between publication and the receipt of reprints from the printing company frequently results.

Proof. When the manuscript is about to be set in type, the editor notifies the author that his manuscript is to appear in a particular issue, informs him that he will receive the galley proof soon, and urges him to make the necessary corrections on the margins of the galleys and to return both proof and manuscript to the editorial office within 48 hours. Proof reading is a difficult job that must be done with care. All marks should be made clearly on the margins of the proof and where there is more than one correction in a line corrections should appear in order. In reading proof there should be at least two operations: (1) a silent reading without reference to copy for purely typographical errors, and, (2), a careful reading with the copy for accuracy, sense and all possible errors. With the proof there comes an order for reprints, which is to be returned with the corrected proof and manuscript. No page proof is sent to the author. The editor sees to it that the author's corrections have been made. The importance of excellent copy is shown by the fact that in some instances there are almost no corrections on the galley proof, while in others the number is very great. Clean and accurate copy saves money, time and temper at every stage of the process of publication—from the receipt of the original manuscript to its final appearance in printed form.

Preparation of Text

Style. Authors are asked to write papers as briefly as possible consistent with the adequate presentation of their material. Brevity not only increases the likelihood of publication but also reduces the amount of editorial work, the cost of printing, and lightens the burden of the reader. Since a reader's impression of a paper is influenced by its clarity and directness, the author, in his own interest, should take pains with his style in order to convey his precise meaning to his readers. Good style and form facilitate understanding. To outline the paper several times during its writing improves organization and eliminates duplication. Particular care should be taken to avoid the constant use of simple declarative sentences of uniform length, or of a series of citations which always begin with the author's name. This habit makes for a heavy and monotonous style that is devoid of interest. By varying sentence length and structure, by employing well-chosen subordinate phrases and clauses, and by the use of vigorous and apt expression, authors help their readers and increase the effect of their articles. Authors are also urged to give articles a final and careful literary revision with a view to improving style. Often manuscripts are much improved if they are read, prior to final typing, by another person known to be a competent critic who can make suggestions for improvement in style and clarity. It would be well for all authors to read Katherine Frost Bruner's article (5) which presents the observations of an editorial assistant who struggled for some years with manuscripts prepared by psychologists.

The writing of scientific articles which present the results of investigations, has now become structured into a fairly definite pattern. This usually consists of a statement of the problem, a review of the pertinent literature, a description of the design of the experiment which includes the sampling and control devices used, a description of the measurement techniques and apparatus, a statement of the results, an interpretation or discussion of the results, and a summary which lists under serial numbers the conclusions reached.

For theoretical articles, analytical reviews, and interpretations of the existing literature the schema is not so clearly patterned. A statement describing the purposes and structure of the reviews sought for the *Psychological Bulletin* follows:

> Psychology, with its numerous subfields and special problems, has too extensive a literature for any one man to organize for himself. One of the primary functions of the *Psychological Bulletin*, is the publication of articles that will achieve integration and survey the literature in a critical and organized manner for a large number of special areas. The optimal article is one which has the character of a good handbook chapter. It is constructive and critical, and gives an accurate and systematic picture of the present status of methods, results, and interpretations in the area in question. Since the audience of the *Bulletin* is a professional one, that type of review which approaches an annotated bibliography, stating only that "A, B, and C found this, but on the other hand, C, E, and F, with different methods found that, and so on," is of relatively little value. Anyone with reasonable diligence can obtain this information from *Psychological Abstracts*. What he cannot obtain so readily is a critical analysis and interpretation of what has been done in a particular field or area.
>
> In the choice of articles to be covered in a review, some discrimination and selection is necessary. If the literature in the period covered by the review is large, it is not necessary to include all titles. Upon nearly every problem there are minor papers which contribute little to the total or which, for other reasons which a competent reviewer will discern, are not essential. Bibliographical completeness, if desired by a reader, can be attained through the bibliogra-

phies of the papers cited in the review. Although *Bulletin* articles should not include extensive reports of original data or detailed tabular analyses of data already published, they may well include suggestions with regard to topics of investigation and modes of research that will meet the deficiencies brought out in the review and thus contribute to scientific advance in the field surveyed.

Headings. The reader's comprehension of the contents of an article is substantially facilitated, if the main features of its framework are indicated by appropriate headings. Various forms of printed headings are available. Their use varies somewhat from journal to journal and with the length of the article. For long reviews of the literature, such as those published in the *Psychological Bulletin*, three kinds of headings are ordinarily used: a center head in caps and small caps, which indicates the main divisions of the content; a center head in italics which indicates larger subdivisions within the main divisions; and a side head in italics which indicates the smallest subdivisions. With shorter articles, sometimes only one type of center heading and one type of side heading are used. With very short articles only one type of heading is necessary.

Length of articles. The maximum length of an article for most psychological journals without special arrangement is 32 printed pages, which, at the maximum, is 16,000 words. If there is an extensive bibliography or many graphs and tables the number of words must be reduced proportionately. Sixteen-thousand words is the equivalent of 48 pages in elite typewriting, and 58 pages in standard or pica typing.

Smaller type. In a number of the journals material which is explanatory, descriptive of techniques, procedures and apparatus or of secondary interest is printed in smaller type. While this increases the amount of material on a page, the saving is not great, but it is a worth while practice because it helps the reader discover the author's plan. Authors should indicate material to be set in reduced type by a light pencil line in the margin of the text.

Series of statements, which are numbered or lettered, are usually set in smaller type to give additional emphasis and clarify presentation. Where each statement consists of one or more sentences, it is common practice to place these in smaller type and to begin each separate statement as a new paragraph. On page 347 of this article, under the heading *Order of publication*, an example of this practice is found. The editor's work is facilitated if, in typing, each numbered or lettered statement begins with the line, instead of running on continuously.

Quotations more than two sentences in length are commonly set in smaller type without quotation marks. If there is another quotation within a quotation set in smaller type, double, not single quotes, are used.

Style book. The journals of the APA ordinarily follow the *Manual of Style* (18). This book is a standard reference manual on matters relating to the preparation and composition of manuscripts, as well as proof reading and editing.

Capitalization. The extensive rules for capitalization given in the *Manual of Style* (18) are not repeated here. But a common difficulty encountered in manuscripts submitted for the psychological journals, centers about words such as blank and schedule and test, in phrases such as the Stanford-Binet Test, the Vocational Interest Blank, and Haggerty-Olson-Wickman Behavior Rating Schedules. Where reference is to a specific test or form and the precise and official title is given, capitals should be used; where, however, a general reference is made to blanks or tests, capitals are not used. Authors who make many references to specific tests, are often very inconsistent in their use of capitalization to the great detriment of the editor's vocabulary.

Do not capitalize departments, as department of psychology, unless used as an address, nor titles unless they precede the name. It is Professor Clark L. Hull of Yale University, and Clark L. Hull, professor of psychology in Yale University. Colleges and schools are capitalized in phrases such as Carleton College, or the Medical School.

Compound words. Consonant with the modern trend, it is our practice to use the hyphen as little as possible. Although most compound words are written without the hyphen, authors should consult both the *Manual of Style* (18) and the dictionary in case of doubt.* Compound words involving the use of "non" do not call for a hyphen as in nonessential and nonadjacent. Widely used technical terms, though often hyphenated in popular writing, are not hyphenated in technical writing. These include such frequent terms as *setup, formboard, textbook, feebleminded.* Technical phrases composed of nouns such as *child welfare training, public welfare administration,* are not hyphenated. The hyphen is used with numbers as in a *fourth- or fifth-grade lesson,* or in such a phrase as *two- and three-year-olds.* Compounds of nouns such as *book, house, mill, room, shop, work, fold,* etc., are not hypenated, thus *notebook, classroom, workshop, woodwork, tenfold.*

Even so, it is only in the English language that a gentleman can take unto himself a gentle-woman and beget a generation of gentle children.

Punctuation. The rules for punctuation are so numerous and are presented in detail in so many manuals for writing, and also in the *Manual of Style* (18) that no summary is given here. In modern practice, fewer commas are used than was formerly the case. Often reading aloud a sentence about which there is question will facilitate the placement of punctuation marks since their purpose is to represent the pauses that make for clear reading. An error that causes some difficulty involves the placing of commas when abbreviations are used within matter that should not be separated, thus it is 2 hrs. 4 min., 3 ft. 6 in. Where difficulty is encountered in deciding on punctuation, recasting a sentence into two or more sentences will often eliminate the problem and add clarity to the text.

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* Even the dictionaries do not agree among themselves. Cf. Ball (4).

Quotation marks. Much difficulty is encountered with quotation marks, as there seems to be a widespread impression that when a single word is placed in quotation marks, single quotes should be used. Double quotes are always used for quotations from a single word up to two sentences in length, unless the particular word or passage is within a larger quotation, which is itself set off by double quotes. When a quotation is longer than two sentences it is set in reduced type and quotation marks are not used.

The comma and period are placed inside the quotation marks as a matter of typography. Thus, Pavlov said, "Conditioning in this instance was completed in ten trials." To put the period after the quotation mark is a common error. Even when a single quoted word is used at the end of a sentence the same rule is followed, as—Pavlov said that the dogs were "nervous." Editorial work is facilitated if all quotations except those a sentence or two in length, are typed so that they are separated from the text and begin on a new line.

Numbers. Numbers are always written out when they begin a sentence. If this is undesirable, reconstruct the sentence. Numbers under 10 are written out, except when they occur in a series, such as 2, 5, 8, and 10, or accompany the word "pages," in making a reference. Exact numbers should be given in arabic numerals, while round or approximate numbers are spelled out.

Abbreviations. Abbreviations are used for widely-used technical, statistical and psychological terms. A very complete list of commonly-used popular and scientific abbreviations is found in the *Manual of Style* (18). Many modern statistics texts contain lists of statistical abbreviations under headings such as *Symbols used in Formulas* as in Dunlap and Kurtz (7) or *Glossary and Symbols* as in Walker (11).

> If any word which could well be abbreviated occurs frequently in a particular paper, its abbreviation may be specified the first time it occurs in parenthesis after the term and the abbreviation in the text used thereafter, e.g., psychogalvanic reflex (PGR) or electroencephalogram (EEG).
>
> Abbreviations for many widely-used terms are set in caps without space or period as in the following examples: IQ, CR, AG, EQ, CA, MA, and ACE.
>
> Abbreviations in caps without periods are used for scientific and governmental organizations and for military and naval terms where the context is clear, Thus, we have AAAS, APA, AAAP, SPSSI, NRC, WAC, WAVES, USN, CBS, TVA, CAA, YMCA, and YWCA.
>
> It is permissible to abbreviate the word figure when it is followed by a number, as Fig. 2.

Words should not be abbreviated on one page and written out on the next, nor should measurements such as those of temperature be given in

Fahrenheit on one page and in Centigrade on another. If authors will make their manuscripts as consistent as possible in these respects before they are submitted for publication, much editorial labor and the ccst of many alterations in proof will be eliminated.

Italics. The text of an article should be as free as possible from underlining in the typed copy. Underlining always means "set in italics." Italics can be used when terms with special meaning occur for the first time and occasionally where it is necessary to give special emphasis. Titles of books, and of published documents, and the names of journals when used in running text are usually italicized. Foreign words and phrases appearing in the text are italicized with the exception of some words and phrases which have been used so much that they have become part of our language. The *Manual of Style* (**18**) should be consulted when in doubt.

A list of foreign words of wide usage that are not italicized follows: alias, a posteriori, a priori, apropos, bloc, bona fide, camouflage, clientele, consensus, contra, creche, cul-de-sac (pl. culs-de-sac), datum (pl. data), elite, en route, ensemble, entante, erratum (pl. errata), et cetera, ex cathedra, ex officio, extempore, finis, inter, intra, laissez faire, milieu, mores, motif, nil, per annum, per capita, per cent, per diem, per se, prima facie, pro and con (tra), pro rata, role, savant, schema (pl. schemata), status quo, versus (vs.), via, vice versa. Some Latin words and phrases are always italicized. These are: *circa*, *et al.*, *ibid.*, *idem*, *infra*, *loc. cit.*, *op. cit.*, *passim*, *g.v.*, *sic.*, *supra*, *s.v.*, and *vide*. Some are not italicized such as cf., e.g., etc., i.e., viz., vs., unless ambiguity would result.

Statistical formulae. Ordinarily common and widely-used statistical formulae are not printed, because they are very expensive. If formulae have been developed especially for a particular research, or are rare or new, they may be printed. Otherwise, citation of the source is sufficient as the readers of psychological periodicals have reference books available which contain most formulae.

References to bibliography. Since the practices with respect to references and bibliography vary somewhat from journal to journal, the author should consult previous issues of particular journals for guidance. Where fewer than five references are made in the body of the article, some editors prefer the use of footnotes numbered in series to cumulated references at the end. Where more than five references are made, the references should be cumulated at the end of the article and indicated by numbers in parentheses within the body of the text. Such references are placed as near the authors' names as possible and inside the period or the comma as in the following examples:

Bunch and McTeer (**25**), in their study. . . .
The most recent experiments in the field are by Gibson (**34**).

In referring quotations to page number and citation, the following form is used:

In Robinson's experiment "there was a total . . . in varying temporal positions" (**105**, pp. 6–7).

Where there is more than one reference the numbers are in a single parenthesis separated by commas as:

that contribute to delinquency in times of peace (**24**, **34**, **51**, **90**, **127**).

Appendices. Occasionally a manuscript with an appendix is submitted. While appendices can be published in monographs, it is awkward to print them in a journal article. Authors should either incorporate such material within the body of an article or eliminate it.

PREPARATION OF TABLES*

Most scientific data are presented in either tabular or graphic form or in both. The table is an effective device for condensing data. More information can be conveyed in the same area in tabular form than in either verbal or graphic form. Its principle disadvantage is that trends are not immediately discernible. For the benefit of the reader and the pocketbook of the author and the publisher, tables should be well organized and kept as simple as possible. Since the type-setting for tables is often a special job, it can be very expensive. Presentations of data in both tabular and graphic forms is usually not necessary. Nor should data presented in the table ordinarily be quoted in detail in the text. Instead, the text may present a summary, conclusion or interpretation of what the table or graph shows.

Rules for tables. While it is difficult to lay down complete rules for table construction, the following principles are important:

1. The table should be numbered even if it is very small. The number should be placed in the center of a line.
2. The title of a table should be brief and yet complete enough so that the table can be read without reference to the text. The heading of a table should be typed thus:

TABLE XII

TITLE HERE IN CAPITAL LETTERS

3. Partition the table by suitable spacing of entries, rather than by use of lines. The various journals differ in the use of rules for tables. Some use no rules, some use horizontal rules, some use both horizontal and vertical, but in any event the author should never make any rules either horizontal or vertical with typewriter, pen, or pencil. This is an editorial matter which had better be left to the editor. The author can best help by leaving as much space as he can between columns and between headings.

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* Substantial assistance in the section on the preparation of tables and graphs was had from a mimeographed copy of "Suggestions for Writing a Thesis," (**20**) prepared by a committee at Northwestern University, under the chairmanship of Claude Buxton. Exhibits I and II of a poor and a good table, respectively, on page 356 are taken directly from that article.

4. All entries in either a row or a column should be comparable and presented in comparable form.

5. Avoid the duplication within the table of entries which should go into the title of a column or row.

6. Key data or significant data (e.g., factor loadings above some "significant level") may be underlined wherever they occur in the typescript (and set in bold face type or italics in printing).

EXHIBIT I

A POOR TABLE

Table 23. Relation between color blindness distribution and the kind of group studied.

	Whites	Whites	Wh.	Amer. Ind.	Amer. Negroes
Number of cases	2000	1286	448	624	323
Number of color-blind individuals	159	106	35	12	12
% Color-blind	7.5	(8.20)	7.80	1.90[1]	(3.70)
Investigator	Von Planta	Miles	Haupt	Clements	Clements

[1] Garth tested 399 Indians and found 1.79 per cent of them to be color-blind to red and green.

( ) Compare these two values.

EXHIBIT II

A GOOD TABLE

TABLE XXIII

GROUP DIFFERENCES IN INCIDENCE OF COLOR-BLINDNESS

Group	Investigator	Number of Cases	Number Color-blind	Per cent Color-blind*
Whites	Van Planta	2000	159	7.95
Whites	Miles	1286	106	8.20
Whites	Haupt	448	35	7.80
Amer. Indians	Clements	624	12	1.90†
Amer. Negroes	Clements	323	12	3.70

* Compare particularly the percentages for whites and American Negroes.

† Garth tested 399 Indians and found 1.79 per cent of them to be color-blind to red and green.

7. If a heading or entry needs some special comment, it may be marked with an asterisk or some other symbol and the comment written as a footnote to the table. Numbers should not be used for such identifications because they might be confused with table entries.

8. Show the grouping of columns by a heading centered over all members of the group; show the grouping of rows by a single entry at the left on the first of such rows. Extra spacing of groups of rows or columns will help greatly here.

9. For convenience in typing or type-setting a square shape or a rectangular shape approximating the shape of a half-page or page is most useful. A very long and very narrow table, or very short and very broad table presents difficulties in type-setting. Examples of good and poor practice are found in Exhibits I and II.

10. Do not put too much in a single table; use more tables and make a single point or a small number of points by means of each one.

Table organization. In using a table an author, too often, tries to crowd in so much material that the table has to be set lengthwise on the page. More frequently than not this wastes much space because the table seldom contains enough material to fill the entire width of the page. Readers also are annoyed if they have to turn a page sidewise. By repeating the first column, which should contain the values of, or a description of the independent variable, a wide table can be broken into two parts which can be fitted on the page in the proper manner. Often by rearranging a table, it can be made to convey its information more clearly to the reader and save cost of composition. The same data are presented in two sample tables in Exhibits I and II. The latter is clearly much superior to the former.

There is some variation in practice in arranging the seriation in a table. Formerly the practice of putting the smaller quantities at the top and moving downward to the larger quantities was common. This is still the procedure with tables of logs, squares, reciprocals, etc. and with descriptive numbers or letters and with dates as

Type A	Size 1	1910
Type B	Size 2	1911
Type C	Size 3	1912

But tables with class interval designations which formerly began with the lowest interval at the top, increasingly are printed with the largest class interval at the top, i.e. tables tend more and more to be set up like graphs. This practice is followed in most modern statistical texts. Bi-variate tables, almost without exception, increase their magnitudes from left to right, and from bottom to top. Many tables presenting the results of an analysis of variance follow a similar practice.

Separate pages. Tables should be typed on separate pages and directions for their insertion in the text given to the printer by means of a device to be described later. Typing tables on separate pages often saves much time in the preparation of a manuscript, since the text can be extensively revised without disturbing the tables.

The author must avoid a wording in the text which exactly fixes the position of a table. It is common for a manuscript to read: "These results are shown in the following table:" This implies that the table will follow the colon. In the page make-up, however, the colon may come so close to the bottom of a page that there is no room for the table. All tables should be provided with numbers and referred to by numbers. The author should also avoid the use of "the table above" or "the table below" because these references are often made incorrect by the rearrangement of the text and table sequence required in pagination.

PREPARATION OF CUTS AND GRAPHS

The material submitted to editors from which cuts are to be made varies widely in skill of execution. Many authors supply ink copies of rough working drawings of graphs, charts, equipment or conceptualized schemes. Sometimes the editor returns these to the author with a request to furnish more acceptable copy; at other times the editor in desperation runs the illustrations as submitted because he has learned what a slow and unsatisfactory process extended correspondence with authors can be. And this despite the existence of excellent manuals and discussions of the principles of graphic presentation. Many textbooks on statistics contain sections which contain rules for the construction of graphs and illustrative materials. The most complete and detailed source for principles, layout and drawing are the two pamphlets issued by the American Standards Association*† (**15**, **21**), which also contains illustrations of good and bad practices. Psychologists and laboratories that have occasion to prepare many graphs or charts for publication should have copies of these pamphlets. Several extensive texts or manuals are also available (**2**, **6**, **8**, **12**).

Design. The illustrations for an article should be prepared with the same attention to detail given any other process accompanying publication. A carelessly constructed graph or a poor half tone often raises a question as to the care with which the whole project has been accomplished. The author should plan an illustration with its final appearance on the printed page clearly visualized. The size of the page, which differs for the various journals, has a definite relation to the size of the units which are to be selected for both the horizontal and vertical axes. The space available should then be considered in terms of utilizing a full-page, a half-page, a one-third page or even smaller part.

Colored cross-section paper. These considerations show the futility of considering even for a moment a graph or other drawing on standard ruled cross-section paper. While these papers are a laboratory necessity and are satisfactory for theses or reports on $8\frac{1}{2}\times 11$ paper, they have no place in a publisher's office. Since the spacing of lines on cross section paper seldom bears a useful relation to the page-size, an author would better start with a blank piece of illustration board before him; upon it he can inscribe the lines he wants where he wants them.

Aside from these aesthetic considerations, cross-section paper is unsatisfactory because the making of a cut is a photographic process in which the various colors photograph differently. Hence there may be an unexpected change in the appearance of the grid in an otherwise well-made illustration. One author made lines with India ink on red one-millimeter ruled paper. Since some colors affect photographic plates just as black does, when the drawing was reduced one-half, there appeared a harsh grid of very black lines ½ millimeter apart upon which one could barely see the lines that had stood out so incisively in the original drawing. Because blue-lined grids on a white background do not photograph, an author who expects to find the grid coordinates in his printed article is disappointed if he uses such paper.

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* Modern textbooks on Engineering or Mechanical Drawing contain chapters on Charts and Graphs. Usually these are condensations of the pamphlets of the American Standards Association.

† The APA has a representative on the Committee on Standards for Graphic Representation of the American Standards Association.

Size. After an author has determined the size of a full printed page in the journal of his choice and has chosen the pertinent illustrations from among his many working papers, and has decided whether he wants a full page or a definite fraction of it devoted to his graph, he is ready to prepare copy for the printer. A drawing should be at least twice the size of the final printed area and may well be made even larger than this. It is not even necessary to restrict one's self to integral values, for every rectangle constructed on an extension to the diagonal of the original page size (see Fig. 1.) will preserve the same proportions in reduction. The draftsman has only to mark the desired width in inches at the bottom of the copy. If the original drawing is made several times larger than the final graph the small inaccuracies in the drawing are much reduced or eliminated in final copy. A beginner frequently uses all the space for the drawing proper and then finds that he has no space for the scale designations. From the beginning space for the scale designation should be provided for by lightly ruling a line with pencil at the bottom and at the left side of the area covered by the grid as shown in Figure 2.

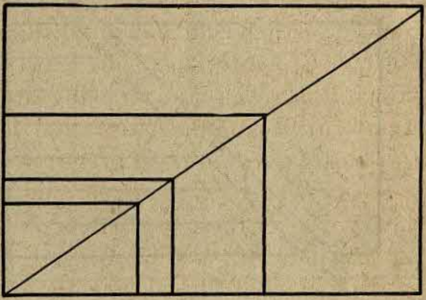

FIG. 1. Any of the rectangles shown will preserve their relative dimensions when enlarged or reduced.

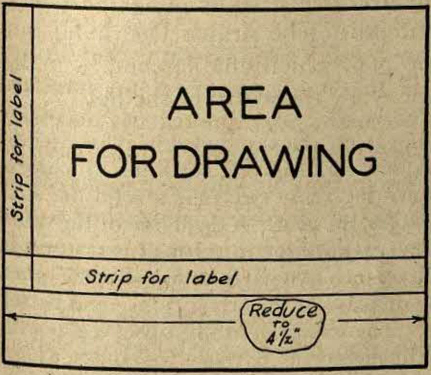

FIG. 2. The cut will include the lettering in the "strip for label" when the copy is marked as shown. It will not include the direction to the printer to "reduce to 4½"."

Making the grid. After the strips are laid off for the scale designations one often finds himself with awkward dimensions, say 6 11/16 inches in the horizontal and 12⅝ inches in the vertical direction. To use familiar units as ½ inch or ¾ inch for the divisions of the ordinates is, of course, impossible. It is a mistake to restrict one's self to these units.

By laying a scale in a diagonal direction across the area so that the zero mark is any place on the x-axis and the inch mark corresponding to the number of spaces wanted is on the top-most horizontal ruling, then a series of dots placed along the scale at the inch marks as shown in Figure 3, will serve to locate the divisions of the ordinates, equally spaced but separated by what would be very cumbersome units measured in inches. No general rule can be formulated concerning the number of lines needed in the grid except to say "use the smallest number consistent with the function of the graph." These lines should first be made with a pencil, and should not be inked in until the rest of the graph has been completed. In many graphs every fifth or even every second line is made heavier, but there is no point to doing so unless some recurrence such as every seventh day or every twenty-four hours needs to be emphasized. In colored coordinate paper where evey fifth or tenth line is made heavier, the intervening lines are construction lines.

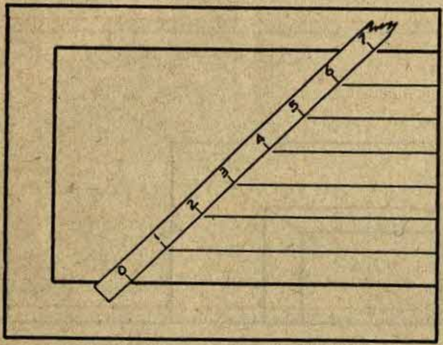

FIG. 3. A quick method of preparing coordinates when dealing with odd dimensions.

Inking in the graph. The experimental points to be plotted are best indicated by a small circle which should not be drawn free hand but with an instrument known as a drop pen, which enables one to make very small circles and at the same time, vary the width of the line.

If more than one set of data is to appear on the same graph, it is safer to make both sets with the same drop pen and to fill in one set later to make a solid circle. The best line to use in connecting these circles is a solid line distinctly heavier than that which is planned for the grid. A dash line of the same weight is best used for a comparison curve. If a large number of curves cross and recross it is better to break the graph up into two parts or to use some other method of presentation. Many confusing displays of the latter type could better be represented by means of bar charts. The experimentally observed points should be connected by short straight lines except in those instances where some demonstrable law, the mathematical statement of which is known, underlies the whole phenomenon or where the results have been smoothed, in which case it is customary to represent the smoothed or generalized curve by a continuous line and indicate the actual observations by small circles, triangles or squares.

Surface graphs. With frequency distributions we are more interested in the area under the curve than in the height of the ordinates. The surface character of such curves can be shown better if they are made to stand out in some way from the background.

A convenient way to accomplish this effect is to ink in the coordinates only in those positions which show if the surface were really cut out of some opaque material and laid on the coordinate system. Some authors cross-hatch the surface or fill it in solidly in black. If the cross-hatching is carefully done with lines that are not too heavy nor too close together a satisfactory appearance results. It is, however, very difficult to keep the cross-hatching absolutely uniform. Filling in with solid black is never satisfactory because of the over-contrast with the white areas of the page. It is satisfactory for the author to furnish a plain drawing even though he wishes it to appear shaded on the printed page. He has only to write "Use Ben Day No. 27 diagonal screen" and indicate the area which is to be so covered. The engraver will then take care of the matter by the Ben Day process.* The best way to indicate the use of toning screens and any printed lettering is to write the instructions on a transparent cover for the drawing. Often a piece of tracing paper is attached by mucilage to the top or left hand edge of the drawing. This serves as a protection for the drawing and at the same time allows for exact specification because the rough lettering on this sheet is used as a guide to the draughtsman who makes the final lettering on the copy.

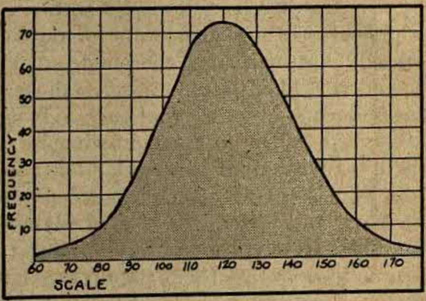

FIG. 4. The effect obtained by using a Ben Day screen and inking only those coordinates which would show if the surface were cut from opaque material.

Lettering by author. The most troublesome feature of furnishing professional appearing copy lies in the problem of lettering, which is a skill which, though once mastered, slips away easily if not practiced consistently. To expect any more than an occasional psychologist to have preserved this skill is asking too much. These facts have caused most authors to fall back on the typewriter for making their labels. A typewritten label, unfortunately, never looks right in print. The characters are usually either too large or too small, are uneven in density, do not have a crisp contour and are too close together. Further, they do not lend themselves to design because the space between the characters cannot be varied. Certain templates or guides which furnish the outlines of satisfactory characters which can be traced by means of special pens are available. The most widely used system is known as Wrico. Others are the Leroy System and the Ames Lettering Device.

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* The Ben Day process, named after its inventor, Benjamin Day, is a mechanical method for producing shaded, mottled or stippled backgrounds.

Lettering by publisher. Probably the best resolution of all these difficulties is for the author not to attempt the lettering. Two courses are then open. One can finish the drawing except for the lettering, indicate what it is to be in the manner described above, and send it to the editor who can find someone to do it. Or an engineering drawing instructor may know of an engineering student who could do the job or perhaps be willing to do it himself.

In the larger cities organizations are available which work closely with publishers in preparing cuts for publication. Type has been developed which closely approximates the single-stroke engineering character usually recommended. This type, handset, can be appropriately letter-spaced, and an impression made on a proof press. A small strip, or a single character, is then attached to the original drawing by means of rubber cement. Considerable skill is required for this work. The type is available in a variety of sizes so that one consistent with the proposed reduction can be chosen. Whether solid caps or caps and lower case is used makes no difference. First-class maps are invariably lettered in this way. Type of the same font as the text can also be set around the cut on the make-up bench in the printing shop. But this operation, called "justifying," is one which all printers dread and for which the publisher has to pay at a very high hourly rate. Because it is so inefficient psychological journals make no use of it.

Half tones. All photographs must be reproduced by making a copy on metal of the original furnished by the author. Invariably some detail is lost in this operation so that only photographs of greatest depth of focus and greatest contrast should be furnished. This detail is best accomplished by a professional photographer but for those who make their own, one simple consideration deserves more attention than it gets. Apparatus should be moved to a neutral background or else the background should be furnished on the scene by using a backdrop of blankets or drapes of some other kind. A little attention to composition should vastly improve the appearance of our journals. Half tones are expensive: if worth while at all, some care should go into their preparation.

A photograph should be inspected in detail by using four sheets of white paper to form a border which can be shifted until the best composition is selected. Use no more area than is needed, even if it is a small part of the original print. Indicate the limits of this area on the borders of the print and mark "crop here," but do not cut the photograph yourself. In general the horizontal dimension as it appears in print should be about two-thirds the width of an entire line of type, and should be so marked. Best results are obtained from a "glossy" or ferro-typed print. The maker of the print should know that it is for reproduction by half-tone. Any retouching should be done before the ferro-typing.

On the back of each illustration the author's name, his address, the figure number, and the title of the figure, should be legibly written. Because photographs are so expensive to reproduce, line-drawings should be substituted wherever possible.

PREPARATION OF THE BIBLIOGRAPHY

In editing articles with long bibliographies, more difficulty is encountered with the bibliography than with any other part of the article. Many bibliographies have the following faults: (1) incorrect alphabetization, (2) inconsistent or incorrect insertion of titles prepared by boards, committees, and anonymous writers, (3) incorrect citation, (4) reference numbers not consecutive, (5) articles by the same author not arranged by date of publication, (6) lack of correspondence between text numbers and entries in the bibliography. Often a single error involves renumbering almost the whole of the bibliography and a change in all the citations in the text. For example, in a recent *Bulletin* article, 323 corrections were made in a bibliography alone. This involved much correspondence with the author, and much loss of time for both editor and author.

Authors are urged to prepare bibliographies with great care. Bibliographic references should first be written on separate cards, a procedure which makes checking new insertions and alphabetizing easier and more accurate. In early copies of the manuscript, spaces between parentheses, as ( ), can be left for inserting references. Just before the final copy is typed, the alphabetization and citations should be carefully checked, the cards numbered consecutively, the bibliography copied, and the appropriate numbers inserted in the text, which can then be copied in final form. While bibliographies are read and edited with care, *editors* cannot verify all references and must place the responsibility for accuracy upon the author. Since references are useless unless correct, every reference in the final manuscript should be verified against the source with regard to the following details: spelling, journal, date, volume number, page numbers, and punctuation, and, above all, accents. References in a foreign language should be checked with especial care (see 6 in Exhibit III).

Style of citation for references to periodicals. In 1938 the Board of Editors adopted the form of citation presented in the World List of Scientific Periodicals, 1900–1933, as official for the journals of the American Psychological Association. It had been used by the *Psychological Abstracts* for some years (17). McGeoch (10), then editor of the *Bulletin*, prepared a list of the journals more commonly used by psychologists. Until his death, McGeoch collected additional abbreviations for journals frequently appearing in psychological references, a practice continued by the present editor. Because the list is several times its original length and because it is convenient to have it readily accessible along with other material on style, it is published here. For journals not on the list published here,* reference can be made to the *World List of Scientific Periodicals* (22), which is available in most libraries.

FORMS OF CITATION FOR JOURNALS

Abh. sächs. Ges. (Akad.) Wiss.
Acta biotheor.
Acta Med., U. R. S. S.
Acta ophthal., Kbh.
Acta oto-laryng., Stockh.
Acta psychiat., Kbh.
Acta psychol., Hague
Acta psychol. Keijo
Actualid. méd. peruan.
Actualités sci. industr.
Africa
Allg. Z. Psychiat.
Amer. anat. Mem.
Amer. Ann. Deaf
Amer. Anthrop.
Amer. Ass. Adult Educ. Adjustm. Serv. Rep.
Amer. J. Dis. Child.
Amer. J. med. Sci.
Amer. Mus. Novit.
Amer. J. Obstet. Gynaec.
Amer. J. Ophthal.
Amer. J. Optom.
Amer. J. Orthopsychiat.
Amer. J. phys. Anthrop.
Amer. J. Physiol.
Amer. J. physiol. Opt.
Amer. J. Psychiat.
Amer. J. Psychol.
Amer. J. Sociol.
Amer. Nat.
Amer. orthopsychiat. Ass. Monogr.
Amer. Scholar.
Amer. sociol. Rev.
An. Inst. Psicol. Univ. B. Aires
Anat. Anz.
Anat. Rec.
Anesth. & Analges.
Ann. Eugen., Camb.
Ann. math. Statist.
Ann. méd.-psychol.
Ann. N. Y. Acad. Sc.
Ann. Ophthal.
Ann. Otol., etc., St. Louis
Ann Surg.
Année psychol.
Annu. Rev. Biochem.
Annu. Rev. Physiol.
Arbeitsphysiologie
Arch. Anat. Physiol., Lpz.
Arch. Anthrop. crim. Lyon
Arch. Antrop. crim. Milano
Arch. argent. Psicol. norm. pat.
Arch. Augenheilk
Arch. brasil. Med. nav.
Arch. brasil. Psychiat.
Arch. Crim. Neuropsiquiat., Quito
Arch EntwMech. Org.
Arch. exp. Path. Pharmak.
Arch. Fisiol.
Arch. gen. Neurol. Psichiat.
Arch. ges. Psychol.
Arch. int. Pharmacodyn.
Arch. intern. Med.
Arch. ital. Biol.
Arch. ital. Psicol.
Arch. Kinderheilk.
Arch. KrimAnthrop.
Arch. Lab. Psicol., B. Aires
Arch. Naturgesch.
Arch. néerl. Phon. exp.
Arch. néerl. Physiol.
Arch. Neurobiol.
Arch. Neurol. Psychiat., Chicago
Arch. Ohr.-, Nas.-, u. KehlkHeilk.
Arch. Ophthal., N. Y.
Arch. path. Anat., Bratislava
Arch. Path. Lab. Med.
Arch. Physiol. norm. path.
Arch. Psicol. Neurol. Psichiat. Psicoter.
Arch. Psychiat. Nervenkr.
Arch. Psychol., Geneve
Arch. Psychol., N. Y.
Arch. Rass.-u. GesBiol.
Arch. Speech
Arch. Surg., Chicago
Arkh. biol. Nauk

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* In case journals are not on either list, the author is urged to make the citation as complete as possible, even to the inclusion of obviously unnecessary information, since the editor can cut unnecessary material more readily than he can supply missing material.

Ass. Stud. intern. Secretions
Athenaeum
Atti Congr. int. Criminol., Roma
Atti Soc. ital. Progr. Sci.
Auk
Aust. Coun. educ. Res. Ser.
Aust. J. exp. Biol. med. Sci.
Aust. J. Psychol. Phil.

Beih. Z. angew. Psychol.
Beih. Z. angew. Psychol., Abh. Wehrpsychol
Beih. Zbl. Psychother.
Ber. I. Kongr. exp. Psychol.
Ber. Kongr. Psychol.
Bio-chem. J.
Biol. Abstr.
Biol. Bull. Wood's Hole
Biol. Rev.
Biol. Zbl.
Biometrika
Biotypologie
Bird-Banding
Bol. Cent. nav., B. Aires
Bol. Educ. Pernambuco
Bol. sanit., B. Aires
Boll. Mal. Orecch.
Boston Soc. psych. Res.
Brain
Brazil-med.
Brit. J. Child. Dis.
Brit. J. educ. Psychol.
Brit. J. med. Psychol.
Brit. J. ophthal.
Brit. J. physiol. Optics
Brit. J. Psychol.
Brit. J. Psychol. Monogr. Suppl.
Bul. Spital. Boli Mint. Nerv. Sibiu
Bull. Acad. Belg. Cl. Sci.
Bull. Acad. Sci. U. R. S. S.
Bull. Amer. Mus. nat. Hist.
Bull. (Ann.) Soc. ent. Belg.
Bull. biol.
Bull. Biol. Méd. exp., U. R. S. S.
Bull. Inst. gén. psychol.
Bull. Menninger Clin.
Bull. N. Y. Acad. Med.
Bull. neurol. Inst. N. Y.
Bull. Off. intercommun. Orient. prof. Brux.
Bull. Pan-Amer. Un.
Bull. Purdue Univ.
Bull. Sch. Educ. Ind. Univ.
Bull. Soc. Sci. Liége
Bur. Stand. J. Res., Wash.

Carnegie Instn Publ.
Čas. Lék. čes.
Cath. educ. Rev.
Cath. Univ. Amer. educ. Res. Monogr.
Cervello
Character & Pers.
Child Develpm.
Child Develpm. Abstr.
Child Develpm. Monogr.
Child Res. Clin. Ser.
Chin. J. Psychol.
Cold Spr. Harb. Sympos. quant. Biol.
Commonw. Aust. Coun. sci. industr. Res.
Comp. Psychol. Monogr.
Condor
Conf. int. Psychotech.
Congr. Hyg. ment., Paris
Contemp. Rev.
Contr. psychol. Theor.
Copeia
C. R. Acad. Sci., Paris
C. R. Acad. Sci. U. R. S. S.
C. R. Soc. Biol. Paris
C. R. premier Congr. int. Rech. psych.
C. R. Soc. Phys. Hist. nat. Geneve
Crítica social.
Cult & Educ.
Cursos Conf.

Delaware St. med. J.
Dtsch. med. Wschr.
Dtsch. Z. Nervenheilk.

E. Afr. med. J.
Ecol. Monogr.
Ecology
Educ. Adm. Supervis.
Educ. Res. Bull., Ohio St. Univ.
Educ. Trends
Education
Eksp. med. Kharkov
Elem. Sch. J
Elgin. Pap.
Encéphale
Encycl. Brit.
Endocrinology
Ergebn. Biol.

Erkenntnis
Eugen. News
Eugen. Rev.
Evolut. psychiat.

Fact. industr. Mgmt.
Family
Fed. Proc. Amer. Soc. exp. Biol.
Finska LäkSällsk. Handl.
Fiziol. Zh. S. S. S. R.
Forsch. Fortschr. dtsch. Wiss.
Forsch. Völkerpsychol. Soziol.
Fortschr. Neur. Psychiat.
Forum. Educ.

Gaz. clin., S. Paulo
Genet. Psychol. Monogr.
Genetics
Gesundh. u. Wohlf.
v. Graefes Arch. Ophthal.
Growth
Gyógyászat

Handb. biol. ArbMeth.
Handb. vergl. Physiol.
Harv. Alumni. Bull.
Harv. educ. Rev.
Harvey Lect.
Heart
Hoppe-Seyl. Z.
Hospitalstidende
Hospitalstindende, Dansk oto-laryng. Selsk. Forh.
Hum. Biol.
Hum. Factor, Lond.
Humanidades

Imago. Lpz.
Indian J. Psychol.
Industr. Psychol.
Industr. Psychotech.
Int. Encycl. unif. Sci.
Int. J. indiv. Psychol.
Int. J. Psycho-Anal.
Int. Z. Indiv.-Psychol.
Int. Z. Psychoanal.
Irish J. med. Sci.

J. abnorm. Psychol.
J. abnorm. soc. Psychol.
J. acoust. Soc. Amer.
J. Allergy
J. Amer. Ass. colleg. Registr.
J. Amer. Ass. univ. Women
J. Amer. med. Ass.
J. Amer. statist. Ass.
J. Anim. Behav.
J. appl. Psychol.
J. Aviat. Med.
J. belge Neurol. Psychiat.
J. biol. Chem.
J. Biol. Med. exp., Moscou
J. cell. comp. Physiol.
J. chem. Educ.
J. clin. Invest.
J. comp. Neurol.
J. comp. Psychol.
J. consult. Psychol.
J. crim. Law Criminol.
J. crim. Psychopath.
J. Delinqu.
J. educ. Psychol.
J. educ. Res.
J. educ. Sociol.
J. except. Child
J. exp. Biol.
J. exp. Educ.
J. exp. Psychol.
J. exp. Zool.
J. Fish. Inst. Tokyo
J. gen. Physiol.
J. gen. Psychol.
J. genet. Psychol.
J. Hered.
J. higher Educ.
J. industr. Hyg.
J. juv. Res.
J. Laryng.
J. Mammal.
J. Mar. biol. Ass. U. K.
J. ment. Sci.
J. Mich. med. Soc.
J. Negro Educ.
J. nerv. ment. Dis.
J. Neurol. Psychiat.
J. Neurol. Psychopath.
J. Neurophysiol.
J. opt. Soc. Amer.
J. Organother.
J. Orn., Lpz.
J. Parapsychol.
J. Person. Res.

J. Pharmacol.
J. Phil (formerly J. Phil. Psychol. sci. Meth.)
J. Physiol.
J. Psychol.
J. Psychol. exp. path.
J. Psychol., Moscou
J. Psychol. Neurol., Lpz.
J. Psychol. norm. path.
J. R. anthrop. Inst.
J. sci. Instrum.
J. soc. Phil.
J. soc. Psychol.
J. Soc. psych. Res.
J. Speech Disorders
J. Wash. Acad. Sci.
Jap. J. appl. Psychol.
Jap. J. exp. Psychol.
Jap. J. Psychol.
Jb. Kinderheilk.
Jb. Philol.
Johns Hopk. Hosp. Bull.
Jugendk.

Kansas Teach.
Kentucky Person. Bull.
Kinderpsychiat.
Klin. Med.
Klin. Med., Mosk.
Klin. Wschr.
Kwart. psychol.

Lancet
Leica
Lyon chir.

Med. Ann. Dist. Columbia
Med. Klinik.
Med. leg. criminol. S. Paulo
Med. Rec., N. Y.
Med. Welt.
Medicina Arg.
Medicine, Baltimore
Mem. phys.-mat. Acad. Sci. Ukr.
Ment. Hyg., Lond.
Ment. Hyg., N. Y.
Ment. Meas. Monogr.
Metron
Mind
Misc. Publ. U. S. Dept. Agric.
Monist
Monogr. Soc. Res. Child Develpm.
Morph. Okol. Tiere
Mschr. Kinderheilk.
Mschr. KrimBiol.
Mschr. Ohrenheilk.
Mschr. Psychiat. Neurol.
Münch. med. Wschr.

Nat. Hist., N. Y.
Nature, Lond.
Nav. med. Bull., Wash.
Ned. Tijdschr. Geneesk.
Ned. Tijdschr. Psychol.
Nerv. ment. Dis. Monogr. Ser.
Neue psychol. Stud.
Neurobiologia
Neurobiologia, Pernambuco
N. Y. St. J. Med.
Nervenarzt
Nevrol. Psikhiatr.
Nevrol. Psychiat.
New Scholast.
Nov. refl. fiziol. nerv. Sist.

Occ. Pap. Bingham oceanogr. Coll.
Occup. Psychol.
Occup. Ther.
Occupations
Opportunity
Oversea Educ.

Pass. int. Clin. Terap.
Peabody Coll. Contr. Educ.
Peabody J. Educ.
Pediatrics
Penn St. Coll. Stud. Educ.
Person, J.
Pflüg, arch. ges. Physiol.
Phil. Rev., N. Y.
Phil. Sci.
Philos. Stud. (Wundt)
Philos. Trans.
Phys. Soc. Lond.
Physiol. Rev.
Physiol. Zoöl.
Polsk. Arch. Psychol.
Pop. Sci. Mon.
Pr. méd.
Prensa méd. argent.
Proc. Acad. Sci. Amst.
Proc. Amer. Ass. Stud. ment. Def.

Proc. Amer. phil. Soc.
Proc. Amer. sociol. Soc.
Proc. int. orn. Congr., VII, Amsterdam
Proc. interstate post-grad. med. Ass., N. Amer.
Proc. nat. Acad. Sci., Wash.
Proc. roy. Soc.
Proc. roy. Soc. Edinb.
Proc. roy. Soc. Med.
Proc. Soc. exp. Biol., N. Y.
Proc. Soc. psych. Res., Lond.
Psikhoterapiya
Psiquiat. Crim.
Psyche., Lond.
Psyche Schweiz. Mschr.
Psychiat. neurol. Bl., Amst.
Psychiat.-neurol. Wschr.
Psychiat. Quart.
Psychiatry
Psychoanal. Quart.
Psychoanal. Rev.
Psychobiology
Psychol. Abstr.
Psychol. Bull.
Psychol. Clin.
Psychol. Exch.
Psychol. Forsch.
Psychol. Index
Psychol. Monogr.
Psychol. Rec.
Psychol. Rev.
Psychol. Stud. Univ. Bp.
Psychol. u. Med.
Psychometrika
Psychometr. Monogr.
Psychosom. Med.
Psychother, Praxis
Publ. Univ. Calif. Educ., Phil., Psychol.
Publ. Hlth Bull., Wash.
Publ. Hlth Rep., Wash.
Publ. Opin. Quart.
Publ. Welf. Ind.

Quart. J. exp. Physiol.
Quart. J. Speech
Quart. J. Stud. Alcohol.
Quart. Rev. Biol.

Rass. Studi psichiat.
Refleksi, Instinkti, Naviki
Relig. Educ.
Rep. industr. Hlth Res. Bd., Lond.
Res. Publ. Ass. nerv. ment. Dis.
Res. Quart. Amer. phys. Educ. Ass.
Rep. aero. Rest Inst. Tokyo
Rev. Asoc. méd. argent.
Rev. Cienc., Lima
Rev. Circ. méd. Cent. estud. Méd.
Rev. Circ. milit.
Rev. Criminol., B. Aires
Rev. Espec. Assoc. med. argent.
Rev. Fac. Cienc. econ.
Rev. Filos
Rev. franc. Endocrin.
Rev. franc. Psychanal.
Rev. gén. Sci. pur. appl.
Rev. méd. lat.-amer.
Rev. neurol.
Rev. Neurol. Psychiat., Praha
Rev. Neurol. Psychiat. S. Paulo
Rev. Neurol. S. Paulo
Rev. Neuro-psiquiat.
Rev. Pedag.
Rev. Pedag., Tucuman
Rev. Phil., Paris
Rev. Psicol. Pedag.
Rev. Psiquiat. Crim., B. Aires
Rev. Psiquiat., Uruguay
Rev. sci., Paris
Rev. Soc. argent. Biol.
Riv. Patol. nerv. ment.
Riv. Psicol. norm. pat.
Riv. sper. Franiat.
Rocky Mtn Med. J.
Rorschach Res. Exch.
Roy. Air Force Quart.

S. Afr. J. med. Sci.
Safety Engng
Sch. Rev.
Sch. & Soc
Schr. Psychol. Berufseign.
Schweiz. Arch. Neurol. Psychiat.
Schweiz. med. Wschr.
Sci. Abstr.
Sci. Med. Rio de J.
Sci. Mon., Lond.
Sci. Mon., N. Y.
Science
Scientia, Milano
Scripta math.
Sem. méd., B. Aires

Sigma Xi Quart.
Skand. Arch. Physiol.
Smith Coll. Stud. soc. Work
Social Forces
Sociometry
Sovetsk. psikhonevr.
Spec. Rep. Ser. med. Res. Coun., Lond.
Stanford Univ. Publ. Educ.-Psychol.
Sth. med. J., Birmingham
Stud. Psychol. Psychiat. Cathol. Univ. Amer.
Stud. Yale psycholog. Lab.
Suppl. Educ. Monogr.
Surg. Gynec. Obstet.
Svenska Läkartidn.
Svenska LäSällsk. Handl.

Teach. Coll. Contr. Educ.
Teach. Coll. Rec.
Teach. Forum (Blind)
Tech. Rep. Hum. Engng Lab.
Theoria
Ther. d. Gegenw
Tidsskr. norske Laegeforen.
Tohoku psychol. Folia
Train. Sch. Bull.
Trained Nurse
Trans. Amer. neurol. Ass.
Trans. Amer. ophthal. Soc.
Trans. Amer. otol. Soc.
Trans. Amer. Soc. Mech. Engrs.
Trans. Coll. Phys. Philad.
Trans. Illum Engng Soc.
Trans. N. Y. Acad. Sci.
Trans. Opt. Soc., Lond.
Trans. Roy. Soc., Can.
Trans. zool. Soc., Lond.
Transit J.
Travail hum.
Tri-St. med. J.
Trib. Hebrea
Trud. Inst. Psikhonevr., Kiev.
Trus. ukr. psikhonevr. Inst.

Ugeskr. Laeg.
Ukr. Psikhonevrol. Akad.
Umschau
Univ. Calif. Publ. Physiol.
Univ. Calif. Publ. Psychol.
Univ. high Sch. J., Calif.
Univ. Hawaii Res. Publ.
Univ. Ia. Exten. Bull.
Univ. Ia. hum. Stud.
Univ. Ia. Stud. Aims Progr. Res.
Univ. Ia. Stud. Charact.
Univ. Ia. Stud. Child Welf.
Univ. Ia. Stud. Educ.
Univ. Ia. Stud. Psychol.
Univ. Ia. Stud. Psychol. Music
Univ. Ia. Stud. soc. Sci.
Univ. Minn. Bull. Emplyt Stab. Res. Inst.
Univ. Minn. Inst. Child Welf. Monogr.
Univ. Mo. Stud.
Univ. Ore. Publ.
Univ. So. Calif. Alumni Rev.
Untersuch. Psychol. Phil.
U. S. Child Bur. Publ.
U. S. Off. Educ. Bull.
U. S. Publ. Hlth Serv.
U. S. Veterans' Bur. med. Bull.

Valsalva
Verh. Akad. Wet., Amst.
Verh. int. orn. Kongr., V, Berlin
Vida neustra
Vyssh. Nerv. Deyat.

West J. Educ.
Wilson Bull.

Yale J. Biol. Med.
Yearb. Amer. psychol. Ass.
Yearb. nat. Soc. Stud. Educ.

Z. allg. Physiol.
Z. angew. Psychol.
Z. Arbeitspsychol.
Z. ärztl. Fortbild.
Z. Biol.
Z. ges. Neurol. Psychiat.
Z. Hals-Nas.- u. Ohrenheilk.
Z. Kinderforsch.
Z. Kinderheilk.
Z. Kinderpsychiat.
Z. Morph. Anthr.
Z. pädag. Psychol.
Z. Parapsychol.
Z. psychoanal. Pädag.
Z. Psychol.
Z. Psychother. med. Pyschol.
Z. Sinnesphysiol.

Z. Tierpsychol.
Z. vergl. Physiol.
Zbl. ges. Neurol. Psychiat.
Zbl. Psychother.
Zh. Nevropat.
Zool. Anz.
Zool. Jb.
Zool. Jb. (Physiol.)
Zoologica, Stuttgart
Zoologica, N. Y.

Misc.

South = S.
North = N.
northern = north.
southern = south.

Rules for arranging the bibliography. The following rules for arranging a bibliography cover the more troublesome details. They include condensation of the more extensive rules for alphabetization found in the manuals, together with special rules covering articles and books for which there is no specific author, and which present particular problems. Present practice is to arrange the citations to known authors in a single alphabetical list followed by a secondary list of the references without specific authors. A sample bibliography (Exhibit III) which illustrates many of the points covered by these rules is found on page 371.

Items should be alphabetized by the surname of author (see examples in Exhibit III).

Enter an article by a married woman under the name which appears on the article to which reference is made.

Enter names beginning with M', Mc, Mac, or St., Ste, whether the following letter is capitalized or not, as if the prefix were spelled out in full as Mac or Saint, as in the following example: McClelland, MacDonald, Macfarlane, Magdsick, McGeoch, M'Intyre, H., McIntyre, J., MacIntyre, T., Mack, Mackay. This standard library practice arises because Mc is an abbreviation for Mac. It eliminates the confusion arising from not knowing whether a name begins with Mc or Mac. It also puts names of similar sound, such as MacMillan and McMillan together.

Enter compound names under the first part of the name as Friedsam-Korger, A., Rubin-Rabson, G., Watts-Dunton, T. (see 6 in Exhibit III).

Names with prefixes should be alphabetized as follows: In *English* alphabetize by the prefix: A. Becket, deCamp, de Silva, Van Alstyne. In *French, Italian, Spanish,* and *Portuguese,* enter under the prefix when it is an article, a preposition,* preposition and article combined into one word as: de Grazia, De Riot, de Rosny, Della Casa, Du Moncel, La Fontaine. If the prefix is a preposition and article that are separated, list under the article as: la Fayette, de. In *German* and *Dutch* list under the main name: Hindenburg, von; Noot, van der. When the prefix is compounded with the name, the name is treated as a single word as: Delacroix, Vanderhoeck, Vonhausen. Names in *German* spelled with an umlaut are listed as if the umlaut were spelled out, Müller as Mueller. In *Spanish* ch, ll, and rr are individual letters and are so treated.

The arrangement of a series of publications by the same author is as follows:

If an author has more than one publication over a span of years, the publications should be arranged in the time order of their appearance (see 1, 2, 3 in Exhibit III).

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* This departs from standard library practice, which distinguishes between De and de. However checking psychological bibliographies shows these have been treated alike for many years and placed under D.

If an author has more than one publication within a single year, the publications within that year are arranged alphabetically by title disregarding articles (see 1 and 2 in Exhibit III).

References to joint articles follow articles written by the senior author alone (see 4 in Exhibit III).

If reference is to an article or section prepared by a particular author, but published in a collection of articles such as a handbook or an annual review, entry is made under the particular author's name (see 5 and 9 in Exhibit III).

If reference is to an entire book, which is a collection of articles by various authors, entry is made under the name of the editor, if it is clear that he is responsible for assembling the material (see 7 in Exhibit III).

Anonymous articles are entered at the end of the list after the last alphabetical entry, with the title of the article coming first, followed by the abbreviation Anon., in brackets, thus [Anon.] (see 12 in Exhibit III).

Reports of committees, governmental organizations, etc., are grouped together at the end of the alphabetical list and are arranged alphabetically by title. The title is written first, followed by the name of committee or organization, then by the place, publisher, and year (see 13 and 14 in Exhibit III and items 13 to 22 in the Bibliography at the end of this article). In *Psychological Abstracts* and in library classifications, it is customary to alphabetize such reports under the subdivision responsible. But the rules are so lengthy and there are so many possibilities that can only be resolved in practice by professionals, that in bibliographies following articles, it seems best to depart from this practice, and accumulate such references at the end of the bibliography.* Unless the author has the complete rules available, he tends to get into difficulty, e.g., where does a report of a subcommittee on Planning of the Emergency Committee in Psychology of the Division of Anthropology and Psychology of the National Research Council go? There are four or five possibilities.

EXHIBIT III

A SAMPLE BIBLIOGRAPHY

1. Bills, A. G. The influence of muscular tension on the efficiency of mental work. *Amer. J. Psychol.*, 1927, **38**, 227–251.
2. Bills, A. G. Muscular tension and mental efficiency. *Indus. Psychol.*, 1927, **3**, 281–289.
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5. Burks, Barbara S. The relative influence of nature and nurture upon mental development: a comparative study of foster parent-foster child resemblance and true parent-true child resemblance. Yearb. Nat. Soc. Stud. Educ., 1928, **27**(I), 219–316.
6. Chevaleva-Janovskaja, E. Les groupements spontânes d'enfants à l'âge préscolaire. *Arch. Psychol.*, Geneve, 1927, **20**, 219–233.
7. Cowdry, E. V. (Ed.) *Problems of ageing: biological and medical aspects.* (2nd Ed.) Baltimore: Williams and Wilkins, 1942.

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* From now on the *Psychological Bulletin* will print such references at the end of the bibliography with titles in italics.

8. Crafts, L. W., Schneirla, T. C., Robinson, R. E., and Gilbert, R. W. *Recent experiments in psychology*. New York: McGraw-Hill, 1938.
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10. Pomeroy, Julia E. Reaction time of five-year-old children. Unpublished Master's thesis, Univ. Minn., 1936.
11. Whitehead, T. N. *The industrial worker*. Cambridge: Harvard Univ. Press, 1938. Vol. I.
12. *Editorial*. [Anon.] *Manpower Rev.*, 1943, 10, 4–5.
13. *Juvenile Court Statistics (Year Ended Dec. 31) and Federal Juvenile Court Statistics (Year Ended June 30, 1935)*. U. S. Dept. Lab., Child. Bur. Publ. No. 235.
14. *Psychology for the Fighting Man*. Committee of the National Research Council and Science Service, Washington, D. C. and New York: Infantry Journal, Penguin Books, 1943.

Typing the Final Copy

Spacing and page size. The final copy of an article should be typed double space on 8½ by 11 inch paper, with one-inch margins right and left, and top and bottom of the page, with a line length of approximately 6½ inches. If elite type is used, this is 78 spaces, and if pica (standard) type is used, this line length is 65 spaces. Typed in this fashion a page of text in elite runs approximately 330 words per page and page of text in pica type approximately 275 words per page, i.e., 3 pages of elite typing or 3.6 pages of pica (standard) type equals 1,000 words. While the number of words per page varies somewhat in the different psychological journals, because of variations in page size and type the number of printed words usually runs between 450 to 600 words per page. By using 500 words as a base, a rough estimate of the number of printed pages necessary can be obtained. Since 32 printed pages is the maximum articles should be or not over 16,000 words, i.e., 48 pages of elite or 58 pages of pica typing, including the bibliography which runs from 22 to 28 entries per page; if one divides the total number of entries by 25, a close approximation to the number of printed pages required will be obtained. The original copy of a typescript should always be furnished, not a carbon or a mineographed copy. The author should always *keep a duplicate copy of the paper for his own reference needs and as a protection against loss of the original in the mail or handling.*

Numbering pages and inserts. Pages should be numbered consecutively, including the pages containing the tables and the bibliography. Any change of pagination through insertion or omission must be indicated unmistakably. If it has been necessary to insert further pages after once numbering, the number of inserts should be clearly marked on the last regularly numbered page preceding the insert. For example, on page 25 say: "Insert 25a." Then number the inserted page 25a. *All inserts must be on full-size 8½ by 11 inch paper.* Brief inserts of a word or two or of a sentence should be made on the margin of the copy. No fliers or parts of sheets should be glued, stapled, pinned or otherwise attached to the copy since they are so easily torn off and misplaced or lost.

Title and author. The title of the article should appear at the beginning of the first page, followed by the name of the author and the institution with which he is connected.

SPEECH AND PERSONALITY
FILMORE H. SANFORD
Harvard University

The ideal title is as brief as possible consonant with an adequate and precise description of the contents of the article. Titles that are too brief are likely to duplicate titles already used and cause confusion in bibliographies. Titles that are very long increase the expense of composition, create difficulties with running heads and add to the length and cost of every bibliography in which they are entered. In making running heads, it is convenient if titles contain not more than 45 letters. In any case, a title seldom should exceed 15 words. Particular care should be taken to select a distinctive title.

Headings. In typing headings care should be taken to distinguish between center headings for larger subdivisions and side headings, which are continuous with paragraph material (see page 351). It is highly desirable that headings be compact and that they have similar literary form for comparable sections of material. Following are examples of these three types of headings. The first can be indicated by centered typing in caps, the second by centered lower case underlined, and the third by underlining the appropriate word or phrase and running on.

(centered main head)
PRESSURE-VIBRATION SPOTS UNDERLYING TISSUES

(centered subsidiary heads)
Vibratory Sensitivity and Skin Temperatures

(side minor heads)

Intelligence. The modern literature shows that measurements of intelligence. . . .

Smaller type. In some articles there are quoted passages, secondary material and explanatory detail which can be set in smaller type, thus saving space and improving the readability of the article. While formerly it was customary to type such material single space, modern practice is to use double spacing and to indicate such sections by drawing a light pencil line in the left-hand margin of the copy showing the extent of such sections and writing "smaller type" along the line. If material is typed single space typesetting becomes more difficult and more errors are made. If possible, sections to go in smaller type should begin on a new line.

Footnotes. One method of typing footnotes is to place them in the body of the text or at the bottom of the page on which the reference occurs but separated from the text by lines running across the page. The other method is to cumulate footnotes on separates pages at the end of the article. Either method may be used provided the copy is clear. But footnotes should never be run into the body of the text in parenthesis or otherwise, and should be typed *double space*, not single space.

Cuts and tables should be indicated by a clear break in the typing, set off by enclosing lines as follows:

Insert Figure 1 about here

Tables should be typed on separate pages.

Bibliography. The bibliography should be typed double space with an indentation of three spaces for the second line of the reference, as in Exhibit III. Authors' names should be in capitals, followed by the title of the paper, journal (abbreviated from our list of forms for citations or from the *World List* and underlined once), year, volume (in Arabic numerals), initial and final pages (see examples in Exhibit III). For books, the authors' names should likewise be in capitals, followed by the title (edition, if any, see example 7 in Exhibit III), place of publication, publisher and date of publication. In typing authors' names if the author is a man, only the initials are given for the first names; if the author is a woman, the first name is spelled out (compare 1 with 5 in Exhibit III).

Only the initial letter of the first word of a title of an article or book, except in the case of proper names, should be capitalized (see Exhibit III). When there are two or more authors, the conjunction is indicated by the ampersand rather than by the word "and" (see 8 in Exhibit III). When only one volume of a book of more than one volume is cited, the volume number is placed after the date of publication (see 11 in Exhibit III). With Yearbooks published in two parts, parts are indicated by a Roman numeral in parenthesis after the volume number, as in 5 in Exhibit III). Finally, when an unpublished thesis is referred to, it is cited as in 10 in Exhibit III.

CONCLUSION

The purpose of this paper is two-fold: first, to assist authors in the preparation of suitable manuscripts from the standpoint of the technical requirements for publication and, second, to free the editor from making routine corrections of author's manuscript. Careless, slovenly, poorly organized and typed manuscripts are difficult and expensive to handle. Within recent years there has been great improvement in the makeup of the manuscripts submitted to psychological journals. This trend is a definite encouragement to those among us who have been concerned with the problem for many years. It is our present purpose in producing this more elaborate guide to help the members of our profession to become sensitized to the practices that make for good preparation of manuscripts and to gain skill in their use. Research is not finished when the last datum is analyzed. There still remains the effective communication of the methods of research and the results obtained to those competent to make use of them. The mastery of skills involved in attaining this end is a worth while professional accomplishment.

Finally, we hope that those who direct the work of graduate students will constantly hold these standards before them.

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15. *Engineering and scientific graphs for publication. American standard, 1943.* Prepared by the Committee on Standards for Graphic Representation, American Standards Association. New York: Amer. Soc. Mech. Engineers, 29 West 39th St. Pp. 27.
16. *Instructions in regard to preparation of manuscripts.* Prepared by a committee of the Conference of Editors and Business Managers of Anthropological and Psychological Journals (Madison Bentley, Chairman). *Psychol. Bull.*, 1929, **26**, 57–63.

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22. *A world list of scientific periodicals published in the years 1900–1933* (2nd Ed.). London: Oxford Univ. Press, 1934.

PSYCHOLOGICAL DISORDERS RESULTING FROM ELECTRICAL SHOCK

BETTY LOVETT SPENCER
University of Iowa

A survey of the literature on the psychological aspects of conditions resulting from electrical shock reveals many articles in the medical journals, a large part of them in foreign periodicals, but relatively few in psychological journals. The effects of electrical shock are many and varied, and the writers are often in disagreement. Among the immediate effects described are unconsciousness, muscular spasm, ruptures and fractures from the spasms, convulsions, temporary paralysis, dilation of the heart, increase of the cerebrospinal fluid or cerebral edema, and burns. Following the shock there may be such symptoms as headache, confusion, sensory and motor disturbances of various kinds such as deafness, loss of taste, etc., gangrene, convulsions of epileptic nature, and albuminuria. Late and lasting effects which have been reported are ocular disorders such as cataract, strabismus, and even disturbances in color vision; hearing disabilities; affections of the nervous system such as paralyses, disseminated sclerosis, the Parkinsonian syndrome, hemiplegia, and aphasia; epilepsy; and various disturbances of a psychological nature. It is with the last named that this paper is primarily concerned.

In American medical articles little interest is evinced in the matter of psychic disturbances following electrical shock. The fact that such cases have been reported is mentioned, and little more is said. Most of the cases have been in European journals. It is difficult to determine how frequently such cases occur.

Jaffé (9), Alexander (2), Critchley (3), Langworthy (11) and other writers in the field are agreed that neurological sequellae are rare, that in most cases of electrical shock recovery is rapid and complete. However, it appears likely that the percentage of cases with late mental disorders may be somewhat larger than a study of the medical journals would lead one to believe. If mental disturbances are not severe, they probably never come to the attention of the physician. Then, too, the average physician who has his attention directed to other aspects of the case is apt to overlook or minimize the importance of psychological disorders. Many tend to be sceptical and unwilling to commit themselves on such a subject.

Pearl (16) says, "Especially when psychic disturbances are concerned, one is tempted to brand such patients as malingerers or hysteroneurotic persons. It is often difficult to judge how much is due to the effect of the current on the body and how much to an attempt on the part of the patient to obtain prolonged compensation. The current is an agent which may produce profound functional changes in the central nervous system, and thus offer difficulty in properly evaluating symptoms which might be ascribed to it." Jaffé (9) writes, "As in other types of accidents, electric currents have been blamed for a large number of functional disturbances." Langworthy and Kouwenhoven (13), in speaking of instability of the nervous system following shocks, says, "How much of this is due to actual damage of the nerve cells and how much should be classed as a neurosis it is difficult to say. Unfortunately the question of compensation often enters as an important factor." In another article (11) Langworthy writes, "Compensation neuroses are common."

Most of the articles on injuries from electric shock do not mention psychotic disorders following the shock. Some of the writers have noted briefly that various neurotic and psychotic disturbances do occasionally follow shock.

Valega (18) speaks of mental disorders which have been noted, such as compensatory neurosis and more or less serious psychotic conditions. Macfarlan (14) writes, "Neurosis and 'nervous shock' are obtaining a more serious consideration than was heretofore given them. True there is still the occasional malingerer, but more often than not these manifestations are actual symptoms, not feigned, not hysterical." Jaffé (9) comments, "There are also observations on change of character, loss of memory, loss of sexual function, etc." Langworthy and Kouwenhoven (13) say, "Many individuals show an instability of the nervous system for a considerable time." They refer to Panse (15) who examined 21 individuals injured by lightning discharges, almost all of whom were unconscious for a short time following the shock, and found functional disturbances varying from sleeplessness on the first night after the accident to rather severe psychotic manifestations. Critchley (3) says, "States of mental aberration with delirium and hallucinations have been described as developing some months after electric shocks; but it is difficult to be sure of any direct association in the cases on record," and (4) "In addition to the hysterical disorders appearing immediately after the accident, various psychoses may develop after an interval." Pearl (16) states, "Other late sequellae may involve the nervous system. There may be marked disturbances of the psyche, with feelings of inferiority and impending disaster, insomnia, amnesia, defects in concentration, loss of sexual power, and psychoneurotic syndromes such as are seen after cerebral concussion."

Just what happens to the body during a flow of current? Material is not lacking upon this subject, and the answer to the question may throw some light on the cause of late psychological disorders and suggest the types of disorders to be expected. There have been three sources of data:

a. experimental studies of the bodies of laboratory animals subjected to shock;
b. histological studies of bodies of the criminally electrocuted;
c. examination of persons killed in industrial electrical accidents.

The types of injury following contact with electrical current are legion. They range from simple local burns of the skin to deep charring and widespread necrosis involving any tissue (8). The skin offers the highest resistance to the current and blood offers the least resistance. When the skin resistance is lowered due to sweating or wet skin at points of contact, the current enters the body more easily, burns are slight or absent, and internal damage to tissues is greater. The blood is the best conductor and most of the current passes along the blood vessels. The nervous tissue offers fairly high resistance to the current but its resistance is considerably lower than that of the skin and bones. It seems logical that the tissues offering highest resistance would be injured by the heat and that those tissues with low resistance would be primarily affected by the current.

Since the current follows the path of least resistance, once in the body it affects primarily the vascular system. Next in frequency, as noted, are lesions in the central nervous system. Even though the nervous system may not be injured directly, it is affected indirectly by vascular hemorrhages in the brain and cord. These capillary hemorrhages in the nervous system and throughout the body are revealed in microscopic examinations (13).

Critchley (4) is of the opinion that, "Some of the diffuse and isolated cerebral sequellae, as well as some of the psychological after-effects, may be the result of cerebral vascular lesions, single or multiple." Hesser (8) states, "Due to progression of blood vessel or nerve impairment, late disorders of structure and function occasionally develop from the original injury." Langworthy and Kouwenhoven (12) found hemorrhages in the central nervous systems of shocked rats, and Langworthy (10) produced cavities and necrosis of tissue in the spinal cords of rats by electric current. Macfarlan (14) speaks of the mechanical trauma: "The fact that many of the victims of the shock are forcibly hurled down and knocked unconscious must make one mindful of the possibility of cranial injuries, concussion, basal or spinal fracture. Such damage might easily be overlooked." Hassin (7) takes this rather unique view of injuries: "The electric current affects directly the brain tissues and their blood vessels causing a severe jarring or a commotion similar to that sustained in a fall, or in a fast moving train, a phenomenon which may be classified as concussion of the brain."

What kinds of psychological disorders would one expect to find on the basis of such physical injuries, and how are observed cases explained by the injuries? Since the intensity, extent, and localization of lesions resulting from electrical injuries are varied, we might expect to find a considerable variety of disorders. The cases on record are indeed of considerable variety. However, it is possible to make a crude classification of them, as follows:

1. post-concussional syndromes
2. precipitations of latent processes
3. post-encephalitic symptomatologies

1. The finding of post-concussional syndromes substantiates Hassin's (7) view of injuries as given above.

Pearl (16) mentioned that psychoneurotic syndromes such as those seen after cerebral concussion may appear as late sequellae in electrical shock cases. In his outline of neurological complications, Critchley (3) places post-concussional syndromes under psychological disorders. He says, "Post-concussional syndromes are particularly common after severe burns of the scalp, with or without damage of the skull. The usual symptoms consist in headaches, vertigo, nervousness, defective memory, and insomnia, commencing typically some weeks after the injury."

2. Langworthy (11) has said that a severe electric shock may precipitate a psychosis. Hysterical reactions to shock are undoubtedly indicative of a previous tendency toward hysteria and are not the result of some physical change. However, care should be exercised in diagnosing hysteria in electrical shock cases. There is likely to be, in many cases, a real cause for complaint.

Critchley (4) has had the most to say about this type of psychological disorder: "Hysterical manifestations are very common, especially after lightning stroke. Very many cases are on record of blindness, deafness, and loss of speech in the victims of lightning stroke. With electrical accidents paralysis is the common hysterical sequel, and elsewhere I have described the case of a man who fell across the line of an underground railway and immediately became paralyzed although no current was flowing at the time. Hysterical amnesia and states of dissociation are also known."

Schiff, Pichard, and Pouffary (17) present a case which illustrates how electric shock may precipitate latent disorders.

An alcoholic patient, who had previously shown no mental disturbances, was shocked and thereafter had unsystematized visual, auditory, kinesthetic, and psychosomotor hallucinations. This was an atypical chronic hallucinatory delirium with a predominance of incessant motor over activity. There was a first amelioration, after which a complete recovery followed the cessation of alcoholic habits.

The authors think that the electrical discharge affected most particularly the cellular zones touched by alcohol and formed at this level a cerebral meiopragia (decreased functional activity), after which alcoholic excess provoked a veritable prolonged delirium tremens.

Into this classification, precipitations of weaknesses, would probably go also the functional psychoses following shock. Again caution should be used. To say that shocks precipitate weaknesses, unless there have been some previous signs of the weaknesses, is an easy and meaningless explanation, equivalent to saying that the cause of an ailment is a constitutional tendency toward the ailment.

3. Many observers have reported cases presenting symptoms quite like those following encephalitis. Fetterman and Smiley (5) presented such a case and attempted an hypothesis, which seems plausible and which explains the symptomatologies in many cases. They believe that general symptoms such as those found in post-encephalitic cases may

result from brain trauma, whether it is produced by electricity, direct mechanical violence, or infection. The effect of brain trauma is essentially the breaking down of cortical control. The age of the patient is the most important factor in the type of manifestation. They elaborate thus:

> In the functioning of the adult mind, efficiency depends on selectivity of stimuli and reactions. Not all stimuli should be reacted to; not all sensations should receive one's attention. With growing years there develops a cortical control serving the function of inhibiting unnecessary reflexes. . . . Once this inhibiting function is acquired, it may be diminished or destroyed by certain major damage to the brain. The outstanding disease process that affects this function is encephalitis. Post-encephalitic children are characterized by distractability and hyperkinesis. Recently a similar clinical picture has been drawn for children who have sustained severe cranial injury. One may wonder why a hyperkinetic disorder occurs in youth and not in adults. With traumatic damage in older persons we have frequently seen depressed states or paranoid reactions. When the cortex has been damaged by a virus, mechanical or vascular change, the impairment affects the most difficult function. In the youngster, it impairs his ability to concentrate. In the adult his ability to look outward, to study reality is affected. Thoughts are more quickly introverted; the outer environment is less easily understood. In the face of physical difficulties and a misunderstood environment there is a tendency toward worry and suspicion, all of which leads to a depressed or paranoid reaction.

Fremming (6) also reported a child's case.

> A child received a shock from high voltage wires. The physical symptoms soon cleared up, but thereafter, the child showed an extreme alteration of personality, with symptoms closely resembling those following encephalitis lethargica.

General instances of paranoid delusions and intellectual impairment have been described in cases of shocked adults.

> Macfarlan (14) in writing of consequences of electrical shock says, "Mental inertia and amnesia are commonly seen. The symptoms resemble war neuroses or post-encephalitis in the characteristic timidity, fear, uncertainty, lack of memory, and inability to concentrate." The following case of Alexander's (1) shows a post-encephalitic picture. A 34-year-old street car motorman was shocked by a 600-volt alternating current and fell down unconscious, immediately developing myoclonic convulsions in his face. When he regained consciousness twelve hours later he was drowsy, incompletely oriented, and at times delirious and excited. The myoclonic convulsions of the face persisted. In the following year he gradually developed tremor at rest, and rigidity and loss of associated movements of the right hand and arm. During this same time the mental changes became more definite and finally remained stationary; he showed decrease of spontaneity, mental dullness, slowness, unproductivity, disturbance of memory for recent events, stereotyped uniformity, tendency to iterations and perseverations, cataleptic behavior, difficulty in finding words, disturbance of acoustic attention, paranoid delusions and tactile hallucinations. The picture remained essentially unaltered for a period of three years, during which he was observed at frequent intervals.

SUMMARY

The effects of electrical shocks are many and varied. Most of the writers in the field are agreed that neurological sequellae are rare, but they may be more frequent than a study of the medical journals would lead one to believe. The chief change in bodily tissues which might lead to subsequent psychological disorders is the occurrence of capillary hemorrhages in the central nervous system. The mental disorders resulting are of three types: post-concussional syndromes, precipitations of latent processes, and post-encephalitic symptomatologies. The last seem most frequent. Post-encephalitic symptomatologies in children are different from those in adults. Typical of children are hyperkinesis and inability to concentrate; adults tend to become introverted and to develop ideas of persecution.

As electrical shock cases are comparatively rare and as these cases have for the most part been studied from the medical point of view, there has been a tendency for psychological disorders resulting from shock to be passed over lightly. However, the increasing frequency of electrical accidents is leading to a greater interest in all aspects of such cases. The psychiatrist is best equipped to deal with the victims of psychological changes resulting from electrical shock. Probably in the future shock cases will more and more be referred to qualified experts. A more careful follow-up of electrical injury cases might well reveal additional evidence of mental and personality disturbances resulting from the injuries. Certainly the psychological aspects of the problem deserve more attention and are worth further investigation.

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NOTICE

PRELIMINARY ANNOUNCEMENT: THE FIFTY-SECOND ANNUAL MEETING OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION, HOTEL STATLER, CLEVELAND, OHIO, SEPTEMBER 11 & 12, 1944

To Associates and Members of the American Psychological Association:

The American Psychological Association, by resolution of the Council of Directors, will meet at Cleveland, Ohio, on Monday and Tuesday, September 11 and 12, 1944, in conjunction with the meetings of the American Association for the Advancement of Science. The headquarters will be at the Hotel Statler. The plan for the meeting has been developed by the Program Committee in cooperation with the American Association for Applied Psychology and Section I of the AAAS. The Council of Directors and Program Committee have voted not to issue the usual Call for Papers because of war-time restrictions.

The sessions will stress the contributions of psychology to the war and problems of the post-war period. Invited participants will present a program on psychology and the war on Monday morning and a similar program on post-war problems will be held on Tuesday morning. A session on Monday morning will be concerned with the graduate and professional training of psychologists. Monday afternoon will be devoted to a discussion of the proposed reorganization of psychological societies. Time has been reserved during the same afternoon for business meetings of affiliated societies. Tuesday afternoon, September 12, has been reserved for the annual business meeting of the AAAP and the APA, one following the other. Plans for presidential addresses and a dinner are still under discussion at this writing.

A more detailed program will be printed in the July issue of the *Bulletin* and additional information will be mailed at a later date to each Associate and Member.

This notice has been issued by the Secretary on behalf of the Program Committee consisting of Harold Burtt, *Chairman*, Dael Wolfle, and the Secretary, and of the Executive Committee consisting of Gardner Murphy, *President*, Calvin S. Hall, *Cleveland representative*, and the Secretary.

WILLARD C. OLSON, *Secretary*

PSYCHOLOGY AND THE WAR

Edited by
DONALD G. MARQUIS

CONTENTS

The Aviation Cadet Qualifying Examination of the Army Air Forces, by *Staff of the Psychological Branch, Office of the Air Surgeon, Headquarters Army Air Forces, Washington, D. C.* 385

Psychological Consultation Service in an Army Specialized Training Program "STAR" Unit, by *Robert W. Henderson, 2nd Lt. AGD* 395

THE AVIATION CADET QUALIFYING EXAMINATION OF THE ARMY AIR FORCES

STAFF OF THE PSYCHOLOGICAL BRANCH,
OFFICE OF THE AIR SURGEON
Headquarters Army Air Forces,
Washington, D. C.

This article is the fifth in a series describing the Aviation Psychology Program of the Army Air Forces. Previous articles have dealt with the general program (**2**), and with the functions and research activities of the Psychological Research Units prior to June 30, 1943 (**3**, **4**, **5**).

The development of a test that would be suitable for initial selection of men for training as pilots, bombardiers and navigators, and construction and experimental tryout of successive forms of this Aviation Cadet Qualifying Examination was a function of the Psychological Branch, Research Division, Office of the Air Surgeon, Headquarters Army Air Forces, from the fall of 1941 through the early part of the summer of 1943. As of June 30, 1943 the following officers were on duty in the Psychological Branch: Lt. Col. John C. Flanagan, Major (now Lt. Col.) Paul Horst, Capt. (now Major) Paul M. Fitts, Jr., Capt. Robert L. Thorndike, Capt. Frederick B. Davis, Capt. Chester W. Harris, and Lt. William G. Mollenkopf. In addition, the following civilians were serving in a professional capacity: Dr. William O. Jenkins, Mrs. Virginia F. Sheffield, Dr. Mary B. Willis, Mrs. Dorothy Bechtoldt, Mr. William J. McCabe, and Miss Margaret Mitchell. In addition to this specific work in test construction, this staff had general responsibility for policies and procedures for the selection and classification of aircrew personnel. The functions of this office included coordination of research activities in the Aviation Psychology Program, maintenance of liaison with organizations working on related problems, approval of all psychological selection and classification tests and procedures, and related administrative activities. In August 1943, the function of constructing the Aviation Cadet Qualifying Examination was transferred to the Office of the Surgeon, AAF Training Command, and those members of the staff that had been working on the test were moved to PRU No. 3 where development of the Qualifying Examination could be coordinated with the development of tests of intelligence and judgment in the classification test battery. The remainder of this article deals with the historical development, construction, validation, and revision of the Aviation Cadet Qualifying Examination.

HISTORICAL DEVELOPMENT OF THE FIRST FORM OF THE AVIATION CADET QUALIFYING EXAMINATION

The Aviation Cadet Qualifying Examination has been administered to more than a million American men. This examination differs from most other widely used tests in that it has always been primarily a power test administered under a three-hour time limit. Three other important characteristics should be noted concerning the Qualifying Examination: first, it is administered to civilians as well as to Army personnel when they first apply for aviation cadet training; second, applicants for cadet training who fail to pass may take different forms of the examination as many times as they wish, provided only that at least thirty days elapse between each testing; third, the content of the examination has been modified in successive forms in the light of its efficiency in predicting a stated criterion.

Fifteen forms of the Qualifying Examination have already been written and prepared for publication to April 1944. All of the 2,610 items in these forms have been selected from experimental test materials constructed especially for this purpose. The selection of individual items for the final forms of the examination depends on many considerations. Among the prime considerations are item difficulty and item correlation with the criterion. In constructing recent forms of the examination it has been the policy to use, so far as possible, only individual items known to have significant positive correlations with the criterion of graduation or elimination from pilot training.

The development of the Qualifying Examination reflects the fact that pilots, bombardiers, and navigators of the Army Air Forces have always been selected with great care. High physical standards have been set and are still maintained. The requirements of formal education were strict prior to January 1942, when the Aviation Cadet Qualifying Examination was first put into use. From 1927 until January 1942, a man could qualify for aviation cadet training as a pilot only if he had successfully completed at least two years of college work or had passed a written examination covering several basic college subjects. As the number of men required for training as pilots, bombardiers, and navigators increased by leaps and bounds after the outbreak of war in Europe in 1939, and particularly after the summer of 1940, it became evident that not enough college-trained men could be obtained. For this and other reasons, late in 1941 men with high-school education were accepted for enlistment for bombardier and navigator training if they could meet a certain minimum standard on a battery of three tests, the Army General Classification Test, the Army Mechanical Aptitude Test, and a physics test.

It soon became apparent that the demand for pilots could not be met exclusively from the ranks of college-trained men, so in November 1941 representatives of the Military Personnel Division, the Training and Operations Division, and the Office of the Air Surgeon recommended that a single aptitude test for selecting all aviation cadets be prepared and that responsibility for its development and continuing improvement be assigned to the Office of the Air Surgeon. A directive to this effect was signed on December 20, 1941 by General Stratemeyer, then Assistant Chief of the Air Corps.

A psychological research agency had already been established in the Medical Division of the Air Corps during the early summer of 1941. To this agency, now the Psychological Branch, Research Division, Office of the Air Surgeon, was assigned immediate responsibility for the Aviation Cadet Qualifying Examination.

At the request of the Air Surgeon the Chief of the Psychological Branch prepared a tentative outline for this examination early in November and the staff began writing items for the first form. Preliminary approval of the plans for this examination was obtained from representatives of the Training and Personnel Divisions and later the outline for the test and a number of specimen items were presented by the Chief of the Psychological Branch at a conference of representatives of various interested War Department groups presided over by General Cousins, then Assistant Chief of the Air Staff for Personnel.

Two features of this test were stressed in this presentation, first, the practical character of the various sections. For example, the reading and mechanical comprehension sections were based on materials taken from Army Technical Manuals and training texts. Similarly, the words for the vocabulary section were all taken from typical training materials and the mathematics questions were concerned with skills essential to successful work in training courses. The practical nature of the items on judgment and aviation was also pointed out.

The second feature which was stressed was that instead of providing an artificial situation in which the principal emphasis was placed on how rapidly questions such as these could be answered, the test was intended to provide a more natural work situation in which the individual proceeded at his own pace and took as much time as he found necessary to complete the items. Thus, instead of a typical psychological test for intelligence or a conventional educational test of academic achievement, a test of the individual's practical proficiency in doing the types of tasks which would be required of him in the Air Force training schools was to be developed.

These plans for the examination were approved and the staff proceeded to construct the items for the first form of the Aviation Cadet Qualifying Examination, Test AC10A.* After the items had been written, a conference was called by the Chief of the Psychological Branch on December 18 and 19, 1941 to edit and revise the materials prepared for this initial form. A number of professional experts in the field of test construction were invited to attend.†

The following general principles were presented for the guidance of the conferees in evaluating the outline and items for the test:

1. The examination was to be used for the initial selection of navigators and bombardiers as well as of pilots.

2. The examination was to take the place of the requirement of formal education for selecting men of officer quality.

3. The examination would probably make its greatest contribution to the extent to which it predicted graduation or elimination from pilot training schools, since the number of pilots in training is always greater than the number of bombardiers and navigators in training.

4. The examination was to be administered in hundreds of Aviation Cadet Examining Boards scattered throughout the continental United States and in Army bases overseas by men with no professional psychological training. This required that the materials used for the examination and the directions for administering and scoring it be as simple as possible.

The test items were carefully edited by the conferees and the general plan to include the sections listed below with the numbers of items indicated was approved.

Part I. General Vocabulary: 45 items
Part II. Reading Comprehension: 15 items
Part III. Practical Judgment: 15 items
Part IV. Mathematics: 30 items

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* The staff of the Psychological Branch at that time included Major John C. Flanagan, two professional civilian employees, Dr. Paul M. Fitts and Mr. William J. Carnahan and three assistants with some professional training in psychology and test construction, Miss Margaret M. Mitchell, Mrs. Hermione Hawkins, and Mrs. Constance Moerman.

† The civilian consultants were: Dr. George K. Bennett, Dr. Frederick B. Davis, Dr. Truman L. Kelley, Mr. Charles R. Langmuir, Dr. Irving D. Lorge, and Dr. Neal E. Miller.

Part V. Current Events in Aviation and the War: 30 items
Part VI. Mechanical Comprehension: 15 items

Examples of the items in the various parts of Test AC10A are shown in a previously published article (1).

Before Test AC10A was released for use, it was submitted by the Chief of the Psychological Branch to a special board appointed by the Commanding General of the Army Air Forces. This board, composed of Major General Walter R. Weaver, Major General Ralph P. Cousins, Brigadier General Walter F. Kraus, and Brigadier General Luther S. Smith, met with Colonel Harris Jones, Dr. Jerome Hunsaker of the Massachusetts Institute of Technology, and Dr. Walter V. Bingham of the Personnel Procedures Section of the Adjutant General's Office. After the examination had been approved by this board, it was immediately put into official use on January 15, 1942 in Aviation Cadet Examining Boards throughout the continental United States and its possessions and overseas bases.

REFINEMENT OF THE AVIATION CADET QUALIFYING EXAMINATION

Preliminary data concerning the difficulty of Test AC10A suggested that if the minimum score for passing the examination were set at 90,* the number of men required for aircrew training could be secured and the standards would exclude the weakest fifteen or twenty percent of those who had been qualifying under the old two-year college requirement. This passing mark set a fairly high standard for qualification, but it proved in practice to be satisfactory. Passing marks for subsequent forms of the examination have been empirically determined relative to the passing mark on Test AC10A. The standard score on the Army General Classification Test equivalent to a score of 90 on Test AC10A was found to be approximately 119. The correlation between Test AC10A and the Army General Classification Test was .64 in a sample of 282 aviation cadets. More recent forms of the Aviation Cadet Qualifying Examination, Tests AC12I and AC12J, have been found in three samples of approximately 1,000 unclassified aviation students to have correlations of .44 to .47 with the General Classification Test. Since the reliability coefficients of both tests are high, it is clear that the tests are measuring rather different abilities.

As soon as Test AC10A became available in published form, the first of a series of studies designed to increase the efficiency of the examination as a selective device was begun. Since the directive governing the selection of aviation cadets specifies that applicants for cadet training who fail to pass the examination may take it again, it is obvious that new forms of the Qualifying Examination must be released periodically for use in the Aviation Cadet Examining Boards. To improve successive forms of the examination, extensive research has been carried on by the staff assigned to the development of the Qualifying Examination and the results of this research have been immediately put into practical use to improve the procedures for selecting aviation cadets.

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* The score on this examination was the number of items marked correctly plus one-fifth of the number of items deliberately omitted by the applicant. This scoring formula made it inadvisable for an applicant to indulge in sheer guessing.

The basic procedure for research studies of this type is to correlate several sets of test scores with the criterion and with each other and to calculate the weighting of each set of test scores that will yield the best multiple correlation with the criterion. In some circumstances this is a straightforward procedure, but in the case of the Aviation Cadet Qualifying Examination many practical considerations complicate the matter. It is clear that the most fundamental criterion for selecting pilots, bombardiers, and navigators is success in combat with the enemy, but for several reasons this criterion has not yet been used for studies of the efficiency of the Qualifying Examination. First, many months elapse between the time an applicant for aviation cadet training is tested in an Aviation Cadet Examining Board and the time he enters into combat. Second, it is exceedingly difficult to ascertain with a reasonable degree of reliability which men may, in comparable circumstances, be classed as failures in combat flying. Third, the Aviation Cadet Qualifying Examination was initially designed to take the place of the requirement of formal educational training, not to predict success or failure in combat flying.

Since up to this time it has been impossible to use the criterion of success in combat flying, a reasonable and practical criterion would seem to be graduation-elimination from flying training. Another important consideration leads to this same conclusion; namely, the fact that speed in building up a large force of combat flyers demands that only men who have a good chance of successfully completing their training be selected as aviation cadets.

It is apparent that to determine the most meaningful correlation coefficient between scores on the Aviation Cadet Qualifying Examination and graduation-elimination in flying training, the scores of a large sample of applicants for aviation-cadet training would have to be obtained at the time of their examination in the Aviation Cadet Examining Boards, the entire group would have to be sent without further selection to flying training, and the graduation-elimination records obtained. Such a study was recently initiated and the results should be available shortly. This should provide a valuable supplement to the data regarding the correlation of scores on the Aviation Cadet Qualifying Examination with graduation-elimination from flying training which must ordinarily be obtained from seriously curtailed distributions of scores.

To evaluate the efficiency of Test AC10A and subsequently published forms of the Aviation Cadet Qualifying Examination, biserial correlations have been calculated for each group of the various kinds of items used in the examination between the scores of men tested previous to flying training and their graduation-elimination records in pilot training, navigator training, or bombardier training. For many hundreds of individual items tetrachoric correlations between success or failure on the items and graduation-elimination from pilot training have been computed. Since the predictive efficiency of a battery of several tests depends on the intercorrelations of the tests as well as on their correlations with the criterion, intercorrelations of the various kinds of items used in the Qualifying Examination have been obtained from many different samples. For practical reasons, the parts of the Qualifying Examination are not weighted separately when answer sheets are scored in the Aviation Cadet Examining Boards. It is, therefore, necessary to include a number of items in each part that will yield a standard deviation of the proper size to weight each part automatically in relation to the other parts when the total score is obtained by the simple procedure of counting the number of items marked correctly and adding one-fifth of the number of items deliberately omitted.

DESCRIPTION OF FORMS OF THE AVIATION CADET QUALIFYING EXAMINATION

Table I provides a summary of the number of items of various types that have actually been used in the Aviation Cadet Qualifying Examination.

The various forms of the Qualifying Examination may be grouped into three series. The AC10 series, which included Forms A through H; the AC12 series, which included Forms I, J, and K; and the AC14 series which began with Form L. All of the examinations in the AC10 series were designed to select navigators and bombardiers as well as pilots. The examinations in the AC12 series, however, were designed to have correlations with performance in pilot training as high as could be obtained with simple, easily administered paper-and-pencil tests. Several factors made it reasonable to change from the AC10 to the AC12 series. In the first place, after the Flight-Officer Act was passed by Congress, not all aviation cadets became commissioned officers upon completion of their training. Some of them became flight officers. This meant that the Qualifying Examination no longer needed to operate partly as a selection device for officers, and permitted the examination to be less of a

TABLE I

CONTENT OF SUCCESSIVE FORMS OF THE AVIATION CADET QUALIFYING EXAMINATION

Type of Items	Number of Items in Forms Indicated						
	AC10A AC10B	AC10C AC10D	AC10E AC10F	AC10G AC10H	AC12I AC12J AC12K	AC14L AC14M	AC14N AC14O
Verbal Tests							
General Vocabulary	45	15	0	0	0	0	0
Technical Vocabulary	0	0	15	15	0	0	0
Reading Comprehension	15	15	15	15	0	15	15
Interest Tests							
Current Events in Aviation and the War	30	0	0	0	0	0	0
Pilot Aviation Interests	0	15	15	19	30	35	31
Bombardier Aviation Interests	0	15	15	7	0	0	0
Navigator Aviation Interests	0	15	15	7	0	0	0
Avocational Interests Related to Aviation	0	0	0	12	5	0	5
Driving Information	0	0	0	0	0	10	9
Perceptual Tests							
Planning Circuits	0	0	0	0	45	0	0
Hidden Figures	0	0	0	0	45	25	25
Point Distance	0	0	0	0	30	0	0
Path Distance	0	0	0	0	30	0	0
Miscellaneous Tests							
Mechanical Comprehension	15	15	30	30	60	60	60
Judgment	15	15	15	15	25	5	5
Mathematics	30	30	15	15	0	0	0
Interpretation of Data	0	15	15	15	0	0	0
Total Items per Form	150	150	150	150	270	150	150

substitute for educational requirements and more an aptitude test for aircrew personnel. Second, the proportion of aviation cadets sent to pilot training was much greater than the proportion trained as navigators or bombardiers. This being so, it was judged most economical of manpower to have the Qualifying Examination select men for aviation cadet training as nearly as possible on the basis of their aptitudes for pilot training and to rely on the aircrew classification tests to screen out men well suited for navigator and bombardier training from among the group already selected for aptitude for pilot training.

To increase the correlations between the total scores of Tests AC12I, AC12J, and AC12K and performance in pilot training, the Mathematics and Reading Comprehension sections used in the AC10 series were omitted, the number of Mechanical Comprehension and Judgment items was increased, and a group of four, timed, perceptual tests was included. After Test AC12I had been published, a comparison of validities was made by correlating the AC10 total scores and AC12 total scores of 1,230 aviation students who took both tests with their performance in primary pilot training. Despite the curtailed distributions (owing to the fact that only men who passed the Qualifying Examination and who obtained high pilot aptitude scores on the Air Crew Classification Tests were sent to pilot training), Test AC12I showed a substantially higher correlation with the criterion.

Several factors influenced the planning of the AC14 series of examinations. Research data indicated that one type of perceptual item, the Hidden Figures items, could be employed successfully in an essentially untimed test. Conflicting evidence regarding the efficiency of other perceptual tests used in the AC12 series and their possible susceptibility to practice effect led to their abandonment in the AC14 series. Additional types of Interest items, on the other hand, were incorporated in the examinations of the AC14 series. Also, Reading Comprehension items were used again.

RESULTS ACHIEVED WITH THE AVIATION CADET QUALIFYING EXAMINATION

Limitations of space do not permit a full discussion of the relationships found between scores on the various types of tests tried out for possible use in the Aviation Cadet Qualifying Examination and performance in pilot, bombardier, or navigator training. Certain trends, however, may be mentioned. Probably the most useful types of items that have been included in the Qualifying Examination are those in the Mechanical Comprehension Section, and the combination of kinds of Information items included in the Interest Section. The correlations of groups of the former with groups of various types of Interest items tend to be about .40. It seems probable that as additional research data become available regarding items testing avocational interests related to performance in flying training, more items of this kind may be added to the Qualifying Examination, in which the various kinds of interest items are grouped together in a part called General Information.

The perceptual tests used in Tests AC12I, AC12J, and AC12K have shown appreciable relationship with performance in pilot training and have low correlations with other kinds of items tried out for use in the Qualifying Examination. The most satisfactory of the four types of perceptual items used in Tests AC12I, AC12J, and AC12K, the Hidden Figures items, is used in the AC14 series in combination with Mechanical Comprehension, Reading Comprehension, and General Information items.

Of the predominantly verbal items tried in the Qualifying Examination, the most useful are those in Reading Comprehension. Items in this field are based on passages typical of those that student aviators and Air Force officers have to read. Beside contributing to the prediction of graduation-elimination in bombardier and navigator training and, to a limited degree, to the prediction of graduation-elimination in pilot training, selected Reading Comprehension items help to insure a certain minimum proficiency in comprehension among aviation cadets. As might be expected, this type of item correlates most closely with performance in navigator training.

Among the miscellaneous types of items listed in Table I, those testing Mechanical Comprehension are, as noted above, most useful for predicting performance in pilot training. Mathematics items, on the other hand, are of greatest value for the prediction of performance in navigator training.

Research studies to determine the value of several types of items not yet included in any form of the Qualifying Examination and to refine the types of items now in use are currently under way. New types of perceptual items and Interest items are being validated and methods of refining the construction of General Information tests. Mechanical Comprehension tests, and Judgment tests are being investigated systematically.

Most of the time devoted to the preparation and improvement of the Aviation Cadet Qualifying Examination is necessarily spent in constructing, criticizing, and editing test items and in carrying out the statistical work required to validate them, to ascertain their difficulty levels, and to determine the best combinations of them for practical use.* Nonetheless, considerable time and effort is allotted to maintaining high standards both with regard to the editorial content and the format; as a result, the test has been remarkably free from criticism, either of specific items or general content and appearance.

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* The preparation, publication and improvement of the Aviation Cadet Qualifying Examination as well as of the Aviation Cadet Educational Examination and the Flight-Officer Examination are now carried on at Psychological Research Unit #3 by Capt. Frederick B. Davis, Lt. William G. Mollenkopf, and Dr. Mary B. Willis under the general supervision of the Psychological Branch of the Air Surgeon's Office. Others who have also contributed some items for one or more of the later forms include: Major Paul M. Fitts, Capt. Chester W. Harris, Lt. John Dailey, Lt. Frank J. Dudek, Pfc. Leland D. Brokaw, Pfc. John P. Madeira, Mrs. Dorothy C. Bechtoldt, and Mr. William J. McCabe. Civilian consultants have included: Dr. F. J. Brink, Dr. D. V. Bronk, Dr. Truman L. Kelley, Dr. Irving D. Lorge, Dr. Richard E. Vollrath, and Dr. Richard E. Watson.

PSYCHOLOGICAL CONSULTATION SERVICE IN AN ARMY SPECIALIZED TRAINING PROGRAM "STAR" UNIT

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This article describes the activities of nine psychologists in a large "STAR" Unit located in a Basic Training Center (STAR = Specialized Training and Reassignment). Since the type and amount of "professional" work which psychologists in the Army have an opportunity to perform varies with the nature of the organization as well as with the individual's assignment within a unit, a series of "duty-sketches" is presented to indicate how these nine individuals function in a classification unit whose personnel totals 83. Seven of those listed in the "duty-sketches" are classification officers whose training and experience qualify them as Personnel Consultants (**2**, **7**), and much of their work is based on the detection and rehabilitation (or rejection from the Program) of Army Specialized Training Program (ASTP) candidates who are questionable college risks.

The following "duty-sketches" indicate the nature of the duties of these individuals within the "STAR" Unit and suggest that Army needs often coincide with civilian training, experience and interests. (The data in parentheses follows the style of the APA Directory.)

Commander of Unit—Lieutenant Colonel [Lysle W. Croft BS (Ky) 1926, MA (ibid) 1932, PhD (ibid) 1938; Asst Dean, Coll Arts, Sci; Dir, U Personnel Office; Asst Prof, Psychol, U Ky Lexington, Ky.]

Supervises and integrates all activities in Unit; coordinates Unit with Army Service Forces and Army Ground Forces. Duties are primarily administrative, and much of his time is spent in delegating special problems to other officers and passing on their findings. Personally reviews dispositions recommended in all unusual problem cases. Is classification officer of Basic Training Center and is directly responsible for proper classification and assignment of all personnel. Defines the scope of classification and interviewing procedures, lectures to Army personnel, testing of ASTP Trainees, and research.

Executive Officer—Captain [A. Scott Lee BA (Peabody) 1910, MA (Columbia) 1914, PhD (NYU) 1925; Administrator, New York Public Schools.]

Handles most of the non-routine correspondence of Unit such as letters to legislators, army officials and parents. Under the Commanding Officer, directs the Field Selection Board, interprets directives, performs administrative duties.

Chief of Operations—Captain [Carl W. Boyer AB (Muhlenberg) 1923, MA (NYU) 1924, PhD (ibid) 1930; Prof of Ed, Muhlenberg; Dir Ed Dept, Radio Sta WCRA, Allentown, Pa.]

Supervises and integrates the Sections of the Unit that process ASTP trainees in regimental areas (The Initial Interviewing, Testing, "STAR" Selection Board, Final Interviewing and Reviewing Sections). Has direct charge of the work and sees that the policies formulated by the Commanding Officer are followed. Many unusual and difficult classification and assignment problems come to him for disposition or referral.

Member of the "STAR" Board—Second Lieutenant [Stuart Lottier AB (Wayne) 1932, MS (Mich) 1933, PhD (ibid) 1936; Personnel Consultant, Recorder's Court, Detroit, Mich.]

Interviews trainees and assigns them to collegiate curricula and terms by evaluating transcripts, test scores, motivation and other factors. Assists in improving and standardizing "STAR" procedures.

*Personnel Consultant**—Second Lieutenant [Robert W. Henderson AB (Miami) 1932, MA (Akron) 1938; Personnel Res'ch Inst, Cleveland Coll, W Reserve U, Cleveland, Ohio.]

Is Chief of Consultation Service and acts as psychological adjutant to the Commanding Officer. Assigns problem soldiers to Personnel Consultants (including himself) for clinical action and recommendation.

Personnel Consultant—Second Lieutenant [Saul Hofstein BS (Coll City NY) 1937, MS (ibid) 1938, MSW (U Pa) 1941; Psychiatric Social Worker, Phil Child Guid Clin.]

Counsels about half of the problem soldiers referred to Consultation Service. Is responsible for liaison with medical officers, development of clinical activities, and for the section's records and case histories.

Personnel Consultant—Second Lieutenant [Horace H. Corbin AB (Cornell) 1937, MA (Columbia) 1940; PhD (ibid) 1942; Asst instr Psychology, Columbia.]

Divides his time between clinical activities in Consultation Service, and research. Supervises the technical aspects of the Research Section and personally conducts more advanced parts of statistical work on the predictive value of tests used in Unit.

Personnel Technician—Private First Class [Carl C. Steinman BS (Central Normal) 1937, MS (Purdue) 1941; High School, Williamsport, Ind.]

Administers "STAR" group tests. Interviews trainees, and assists in statistical work of Research Section.

Civilian Educational Statistician [Jean Sturgis Ellis, BS (U Delaware) 1942; Public Schools Newcastle, Del.]

Compiles, computes and reports statistics on tests, trainee strength and educational data.

COORDINATION OF ACTIVITIES

The psychologists of this organization are scattered throughout the Unit and many calls are made upon them for advice on such problems as the evaluation of test scores, morale, "STAR" classification, interviewing procedures, and the techniques of test administration (6). For example, the Private in the Testing Section of this Unit is often asked questions about proper test administration, while the Commanding Officer of the Unit is constantly faced with problems dealing with personnel motivation and morale. Each of these individuals is in a position to function as a professional worker and to promote the efficiency of the entire organization by giving to it the benefit of his training and experience.

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* There are three psychologists in the Unit whose principal duty is Personnel Consultant. They and 2 other workers form a Section known as The Consultation Service which is discussed later in the article.

Since it is impossible for a few Personnel Consultants to interview carefully each ASTP candidate (the "STAR" Unit processes as many as 1,000 Trainees per week), all personnel who come in contact with ASTP Trainees must be trained to pick out and refer early those who need individual consideration. Therefore, classes in Interviewing, Personality Army Tests, Test Administration, Military Psychology, and the Personnel Consultant are given to "STAR" personnel. These classes define the function of the military psychologist and emphasize the problems that should be brought to his attention. Also, the Commanding Officer, the Chief of Operations and a Personnel Consultant give talks to the officers and cadre (permanent party) of each training battalion before "STAR" processing begins so that every officer and non-commissioned officer understands some of the purposes and aims of the ASTP and knows where to refer individuals who do not adjust readily to the basic training program.

A CONSULTATION SERVICE

The Commanding Officer of the "STAR" Unit established a Consultation Service to expedite the disposition of the many individual problems that are brought to his attention. For example, all ASTP Trainees whose performance in basic training is not satisfactory must be reported to the Commanding Officer of the "STAR" Unit by the 6th week of the training cycle, and all officers in the ASTP Training Regiments have been given the authority to refer to him any individual (Trainee or Cadre) who is not well adjusted to his particular Army job. The Commanding Officer screens these referrals and turns over to the Consultation Service those which come within its province. The Commanding Officer of the "STAR" Unit is also the Classification Officer of the ASTP Basic Training Center and is in a position to delegate pertinent problems among both Trainees and Cadre to the Consultation Service.

Many large military posts have established sections for taking care of individual problems (1, 3, 4, 5). This particular Consultation Service is unique in that it works mainly with soldiers who are above average in intelligence and very young (the majority of the ASTP Trainees at this post are 18 years old). Consequently, most of the cases seen by the Consultation Service are youths who have good academic ability but who have some trait or deficiency which detracts from their success in basic training. The extent to which these trainees improve in military training is the main criterion determining whether they will be retained in the ASTP. For example, "the book-worm" type who has difficulties on the obstacle course because he has never developed good physical coordination is judged mainly on his efforts to do a little better on each performance rather than on an absolute achievement scale. Also, many of these young soldiers are away from home for the first time in their lives and find the transition from a sheltered home life to the Army a rude shock. Some of the trainees referred to the Consultation Service are homesick; many are frightened by military training and discipline and some exhibit symptoms requiring psychiatric referral. (It is interesting to note that nearly all of those who are diagnosed by psychiatrists as psychotic were passed by Induction Station psychiatrists and that the severance of home ties and the rigors of basic training apparently accentuate personality difficulties.)

The personnel in the Consultation Service is composed of three Personnel Consultants, an enlisted social worker and a stenographer. The approach to all problem cases is clinical and each referred soldier is assigned to a worker who is responsible for making a recommendation based on his findings. When assigned a case, the action of a Personnel Consultant proceeds somewhat as follows:

a. Records of soldier are checked (Service Record, Soldier's Qualification Card, ASTP Personal Data Form, academic transcripts, etc.).
b. Company officers, chaplains, and others who know the soldier are interviewed by phone or personal call.
c. Individual tests are administrated if indicated (Army Wechsler, Rorschach).
d. Soldier is interviewed by Personnel Consultant (modified psychotherapy often produces striking changes as measured by reports from company officers).
e. Soldier may be sent to other agencies such as the American Red Cross, neuropsychiatric clinic, regimental dispensary, or allergy clinic.
f. All information is reviewed and a final disposition is made or recommended.
g. A follow-up is made to determine the adjustment of the soldier and to evaluate the effect of counseling. (A Trainee is usually referred early in the 13 weeks basic training program allowing sufficient time to follow his military adjustment. Those who go to college on the recommendation of the Consultation Service are requested to write back to the Unit listing their grades and making a subjective estimate of their relative success in the college program).

In addition to its clinical activities, the Consultation Service acts as a "clearing house" for all sorts of problems. For example, a Personnel Consultant is on duty during all "STAR" interviews and interviewers are instructed to send to him any individual who presents a special problem. It is standing operating procedure (SOP) for a Personnel Consultant to interview each trainee rejected from the ASTP. These interviews serve as an additional check on the entire classification procedure; give the trainee an opportunity to voice his worries, ambitions, and troubles; and provide a method of referring him further (e.g. to station hospital) if such action is warranted.

It is difficult to assess the value or influence of a small group of individuals in any organization, but the author believes that the activities briefly described here have improved selection procedures in the Unit by emphasizing the importance of carefully studying any trainee whose record or behavior indicates the need of individual consideration.

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BOOK REVIEWS

THORNDIKE, E. L. Man and his works. Cambridge: Harvard University Press, 1943. Pp. 212.

With charming simplicity Professor Thorndike sets forth in these ten short chapters not only what are for him (1) the basic facts of human nature, (2) the laws of learning and (3) the human relations influencing man and his works, but also indicates (4) how this psychology should be applied in the fields of language, government, and philanthropy. The material of this little book consists of the William James lectures which he delivered at Harvard University in the fall and winter of 1942–43. Though in organization and doctrine the lectures follow the author's 1940 book entitled *Human Nature and the Social Order* there is some original matter in the present work, notably the discussion of language.

The arrangement and scope of the volume is clearly indicated in the chapter titles. (1) The genes of the mind, (2) Modification by the environment, (3) Human relations, (4) The psychology of language, (5) The origin of language, (6) Rulers and ruled, (7) Laws and the law, (8) The psychology of punishment, (9) The welfare of individuals, and (10) The welfare of communities.

The three chapters of the first part contain ideas that Thorndike has been expounding for many years. He assumes that the doctrines of his *Original Nature of Man* require no change except verbal reformulation. The essence of chapter I is that man, like other organisms, comes into the world with many of nature's gifts of mind. These innate powers are simply transmitted by genes. Variations of statement concerning inborn tendencies read: The genes cause, the genes provide, the genes link, etc.

As to modification by the environment of what nature gives (chapter II), two and only two forces are necessary—occasion for repetition, and reward. Reward supplies a confirming reaction, a strengthening of connections in the mind, a strengthening alleged to be supported by unknown physiological occurrences.

As stated in chapter III, all complex social behavior is caused in the same way as non-social behavior. The interrelations of buyer and seller, doctor and patient, employer and employee are all explained by tendencies given by the genes and the influences upon them of life's circumstances by repetition of actions reinforced by confirming reactions or rewards.

As a man of excellent will and keen sense of human needs the author proceeds to apply his psychological principles to all sorts of societal problems. As he indicates, however, those principles do not exclusively account for the facts of social life. For example, though the genes provide social instincts they do not make adults obey the aged as happens in societies governed by aged oligarchical males. And so most of Thorndike's discussion of complex problems consists of his own personal opinions and is independent of psychological principles altogether. Certainly his observations concerning social phenomena do not imply his particular psychology. These points are illustrated by the following views. In the realm of law mental age should be used instead of chronological age (137); law will improve itself (144); there is no basic typology (123); there should be fewer laws (341); and, punishment should be minimized (ch. VIII). Only in discussing the welfare of individuals would he stress his principles. Because he believes that three fourths of the variation in abstract intelligence and one half of the variation in health, character, and non-intellectual abilities are attributable to genes, it is necessary, he declares, in order to increase individual welfare to improve the genes.

Since Thorndike's general psychological ideas and his sociologico-statistical techniques have been widely expounded and criticized we need pause only to consider briefly his theory concerning the origin of language. Essentially the theory is that some babble or prattle sound is accidentally connected with an object and then this connection becomes established by repetition and the satisfaction derived from the ensuing meaningfulness of the sound. Perhaps it is no serious criticism to say that as an avowedly speculative statement of how sounds become substitute stimuli for things this theory is in some senses better and in some ways not so good as its pooh-pooh, bow-wow and other competitors. What is more serious is its implication that complex intercommunicative behavior can even in origin be reduced to simple sign-significant phenomena. Here the question arises: Is language a series of sounds or words written or spoken in simple connection with things, or is it a complex performance in an elaborate field involving besides things (including persons) other persons besides the speaker and various conditions. Thorndike's new theory suggests a high probability that he has neglected to keep abreast of modern linguistic developments. The present volume strongly indicates that the reason for this may be that he is more interested in affirming the power of his general principles than in analyzing events.

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YOUNG, P. T. Emotion in man and animal: Its nature and relation to attitude and motive. New York: John Wiley, 1943. Pp. xiii +422.

In writing this book the author aimed beyond a mere textbook. He "attempted to bring a degree of order into the abundant but highly disorganized assortment of facts relating to feeling, emotion, and attitude." After a chapter which defines the field, three of the other nine chapters are devoted to attitude, motives, and needs. The remaining chapters treat the subjects more traditionally identified with the field of emotion, physiological changes, bodily patterns, development, direct determinants of emotion, and predisposing conditions. The author's method of approach to his subject matter is throughout one of defining the meaning of various abstract terms on a level wholly remote from concrete experimental operations or procedures actually used in investigations of emotion. Factual materials, which are more frequently anecdotal than experimental in nature, are introduced by way of illustrations of the words or the relations between words previously defined. The book is not an adequate review of either theoretical or experimental works on emotion. Experimental materials where introduced are treated only superficially. If one were to use this book as a text he would rely heavily on the references appended to each chapter as outside readings in the course. Almost everything in the book is handled in subordination to the attempt to bring new order and organization into the field; and it is appropriate that it be judged with respect to its contribution to theory.

Emotion is defined as "a disturbed state of the organism" (28). When "emotion arises, integrated activity is hindered in some way or other." This definition, which the author admits is arbitrary (37), is held in spite of the patently contradictory fact, also recognized by the author, that every particular emotion is characterized and identified by a form of purposeful, integrated activity. The apparent contradiction the author believes he solves by the simple expedient of pointing out that an event can be observed from many different viewpoints. Looking at behavior in search of "disturbance" is the emotional viewpoint; looking for integrated action is the non-emotional view. In this connection, a sharp distinction is drawn between "emotion" and "emotional behavior," the former meaning upset, the latter integrated action.

This solution to contradictions, namely, that of simply saying that the contradictory elements are products of different viewpoints, without any attempt to construct higher-order concepts as syntheses, is called the "attitudinal approach." As a consequence the book is replete with contradictions. Even the attitudinal approach itself is defined in two different ways. On pages v and 73 it is fairly clearly defined as a form of "eclecticism," a method of tying together "diversified facts" on the assumption that "they are multiple aspects of a single psychological event." Yet in a chapter in which attitude is defined as an individual's predisposition to action, the attitudinal approach is described as "an analysis of the attitudes and motives of an individual" (111).

The table of contents and sub-title of this book are likely to arouse an eager response in the trained psychologist, an eagerness for a sound theoretical rapprochement, which is sorely needed at present, between the concepts attitude, motive, need, etc., on the one hand, and the concept of emotion, on the other. However, beyond a few meaningless generalities, in which the intimacy of the two is either stated or implied, and illustrative anecdotes, many from his own personal experience, the author offers no real theoretical structure which relates the two. The following are examples of the hazy generalities which the reader is expected to be satisfied with. "The concepts of *motive* and *attitude* overlap since both have an influence in directing the course of behavior; yet each concept is distinct and different from the other in some respects" (66). "The psychologist distinguishes between emotions and attitudes, but recognizes that the two are intimately related. On the one hand, many attitudes predispose the individual to emotional upsets, and, on the other hand, an emotional upset may leave the individual with changed attitudes" (110). "Appetites and emotions are intimately related in that both rest upon organic processes, including changes in the viscera" (115). "Attitudes, motives, and states of conflict, built up in the past, furnish the background out of which present feelings and emotions arise" (402). And " . . . emotions and attitudes are intimately related, and the conscious emotion is often associated with conscious attitudes. The attitude is a *part* of the total emotional experience but by no means the whole of it" (300).

This vagueness and confusion of concepts and the relations between concepts are in part the consequences of the even tenor of abstract discursiveness which is held throughout the book, without one lapse into the realm of the operationally defined. The exact definition of the key concept "disturbance" itself is far from clear. Although the disturbance, which constitutes emotion, is usually stated to be a disruption of a process which is going on when the emotion occurs, occasionally (116) it seems that the disturbance *is* the newly aroused response pattern. The book is full of generalities about emotion which flatly contradict this disruption postulate, such as for example, the statement that "excitement sometimes facilitates a skilled performance and sometimes interferes with it" (30).

If the intelligent reader is not already aware of the confused state of the field of emotion, he will certainly be left with that impression after reading this book.

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WALLS, G. L. The vertebrate eye and its adaptive radiation. Bloomfield Hills, Mich.: Cranbrook Institute of Science, 1942. Pp. xiv + 785.

This book provides an account of the eye and its capacities from the standpoint of general biological utility, rather than from the more conventional standpoints of anatomy, physiology, ophthalmology, psychophysics, psychophysiology, histology, or pathology. In the development of this conception of biological utility, the author draws from knowledge that has accumulated in a number of different special fields.

The book "is not designed as a reference book, in which to 'look up' small points from time to time. Rather, it has been written in the style of a textbook, though for a course which has yet to be given in any American university. . . . The material of the book is progressive." (v)

The eye serves the general function of mediating adaptations to surroundings *via* reaction to light. Light reflected, or transmitted, from an object is received into the vertebrate eye through a compound optical system. The essential elements of this system—cornea, iris, lens, retina—subserve various special ocular functions, and are so organized as to suit the incoming bundle of light rays to the biological needs of the organism, i.e. to the eventuation of the chain of neural events which mediate the adaptive response.

The book is divided into three principal parts, each containing six chapters. Part I is "basic" (139 pages); Part II, "ecologic" (410 pages); and Part III, "synoptic" (136 pages). There is an extended bibliography (24 pages), and a detailed index and glossary (64 pages). The book contains 197 illustrations.

The six "basic" chapters are largely concerned with descriptions regarding structural and functional characteristics in a standard (human) eye. The mechanisms for light control, accommodation, and image formation are described. The retina and its terminal elements are characterized in detail. Although these descriptions include much anatomical detail, the discussions are designed to bring out the biological uses of these structures. A few of the more noteworthy points regarding function are mentioned here. A clear distinction is drawn between acuity and sensitivity. Trichromatic vision is indicated to depend upon a central mechanism, and color blindness is ascribed to subnormal differentiation with respect to response to wave length. The positive assertion that the cone is an "older and more primitive" retinal element than the rod comes as a surprise. The two final chapters in this section "The Genesis of the Vertebrate Eye" and "Elements of Vertebrate Phylogeny," seem to the reviewer to be so largely concerned with speculative deductions as to contrast sharply with the essentially factual material treated in earlier chapters.

The adaptive function of the eye is explicated in six long chapters in Part II (141–551). The vertebrate eye has had to accommodate itself to the needs of seeing under diverse physical conditions (in water, on land, in the air, at night, at twilight, in the daytime), and structural modifications have emerged to meet special needs. Modifications brought about to favor vision under one kind of external condition have often not aided observation under other conditions. The yellowishness in the lens, e.g. of the prairie dog, aids diurnal but hinders nocturnal observation. The visual requirements for one kind of condition are sometimes the converse of those for another. The nocturnal eye exhibits increased sensitivity and decreased acuity, while the diurnal eye possesses decreased sensitivity and improved acuity. In other cases, a new condition has been responsible for the appearance of a new structure, e.g. the appearance of spectacles in lampreys, fishes, and reptiles. Ocular differences regarding oildroplets associated with retinal elements, eyelids, extent of visual field, shape of contracted pupil, relation of principal dimension of lens to that of the eyeball, and many other features are described and evaluated with respect to particular vertebrate needs. Although the function of many structures, e.g. twin cones, green cones, tapetum lucidum, cannot yet be definitely specified, the author makes the unqualified assumption that all ocular differences are the consequence of ocular response to special visual needs.

The title "Adaptations to Space and Motion," used for one of the six chapters in Part II, is hardly specific enough; at least, it is patent that all six chapters are directly concerned with adaptations to space. Moreover, the chapter just mentioned and one on "Adaptations to Photic Quality" are largely concerned with rather restricted and special kinds of spatial adaptation—not with the general adaptations treated in the other chapters which animals make in free space.

The six chapters that make up Part III are concerned with detailed descriptions of the eye as a whole, and of the retina in particular, in various representatives of the six chief classes of vertebrates (cyclostomes, true fishes, amphibians, reptiles, birds, and mammals). The treatment throughout these six chapters is essentially restricted to morphological details, and, aside from rather protracted discussions concerning pectin in the avian eye, and the absence of muscular elements in the iris of certain fishes, does not bring out the way that the adaptive function is served. Coming at the end of a work that stresses the use of the eye, these anatomical descriptions are at odds with the conventional practice of using anatomical descriptions as a preparation for discussions concerning function.

With regard to the author's professed ambition to produce a "progressive" treatment of the vertebrate eye and its performances, the present reviewer feels bound in all honesty to submit the pronouncement that he has not succeeded. This judgment is based on several considerations. The three parts of the book do not truly represent a progressive development, but are concerned with three essentially diverse aspects of the eye and vision. As has been indicated already, Part I is essentially an elementary treatment of the structure and function of the human eye, Part II reveals how the eye has met the need of providing for seeing under diverse physical conditions, and Part III furnishes detailed anatomical descriptions of eyes typifying different classes of vertebrates. Moreover, the discussions in the three parts of the book seem to be suited, not so much to the needs of the general reader ("college and graduate student and amateur naturalist"), as those of three essentially different classes of specialists. Part I seems best suited to the needs of the psychophysiologist, Part II will appeal most to biologists and genetic psychologists, and Part III chiefly to comparative anatomists. Finally, in spite of the stress which the author aims to place upon the biological function of the eye, he has failed to develop the idea of the adaptive function of the eye in a progressive way. This is largely due to the fact that Part III is so strictly concerned with the anatomical minutiae which differentiate the various classes of vertebrates. Certainly, the impression is not given that the final six chapters were written in the interest of completing the treatment in Parts I and II.

The book fails to fulfil expectations in another important respect. The author stresses the functional interdependence which exists between the eye and the brain, stating that "our eyes do not see; but we see with our eyes" (2) and that "human vision . . . is the product of a complex brain teamed with a relatively simple eye" (5); however, his characterization of the way that the brain is involved in seeing is utterly insufficient. About all that he does in this regard is to indicate that the optic nerves partially decussate in passing posteriorly (51 f.), that trichromatic vision depends on a central mechanism (91 ff.), and that "binocular single vision" is based on an involved integration of neural events in the occipital cortex (323 ff.). After indicating in these ways that, functionally speaking, the eye and the brain constitute a unit, it is disappointing not to find some characterization regarding the anatomy and neurophysiology that is involved in the posterior part of the visual mechanism in seeing. A better attempt also needs to be made to relate visual acuity, visual sensitivity and other capacities to the occipital cortex.

This neglect is not to be excused on the ground that the occipital cortex is not a part of the eye. The essential unity of the development of the visual mechanism in its entirety is indicated through experiments involving the methods of extirpation and grafting. When an eye is removed early in individual development, the visual centers in the midbrain and in the occipital cortex fail to develop normally; when a much larger eye is substituted, the involved centers in the brain become overdeveloped. After the author has openly professed admiration of a number of workers who recently have been contributing to our knowledge concerning electroretinograms, electrically recorded optic nerve discharge, and cortical response, it is all the harder to understand the utter disregard of these data. These data are not to be suppressed, or avoided, on the ground that their meaning is not yet very clear, because about 50 per cent of the data already included in the book would on the same ground have to be suppressed or avoided. It is essential that they be brought together in so far as possible as basic to the general problem of organic adaptation. If these newer data concerning events in the posterior part of the visual mechanism had been briefly characterized, the book would bear the mark of a more complete treatment of the adaptive function of seeing.

Dr. Walls has laid a broad groundwork for the study of the eye and its functions. The use of the comparative method gives breadth of scope, and the utilization of the genetic method provides perspective. Students of vision will find many places where the plan is only sketchily outlined. The thread that binds together the structure erected on this broad base is the practical consideration of the biological utility of the eye. The completion of this structure will still require countless man-hours on the part of workers in all phases of visual science.

MICHAEL J. ZIGLER.

Wellesley College.

BURTT, H. E. Principles of employment psychology. (Rev. Ed.) New York: Harpers, 1942. Pp. xii+568.

This volume is a revision of the original edition which appeared in 1926. It is a text for students preparing for industrial or personnel work and for industrialists interested in employment psychology. While the topics in this edition differ little from those formerly treated, the material has been essentially re-written. Rating scales, job analysis, vocational interests, trade tests, job criteria, test administration techniques, and intelligence as vocational aptitude are the subject matter of individual chapters. A history of vocational psychology and of pseudo-scientific methods of personnel selection constitute two chapters. Test construction and problems of validation occupy three more. The application blank, oral interview, letters of recommendation, et cetera, compose an additional chapter.

As a tool for personnel and industrial relations men, this book contains little that has not already been stated elsewhere, and possibly more cogently. Moreover, topics of importance to such workers are either left untreated or are superficially handled. For example, a personnel man has the legitimate right to seek of such a text the answer to the question: How valuable are current personality tests in a selection program and which test is recommended? Less than ten pages of the 568 in the book are devoted to the measurement of personality and these are almost entirely enumeration and description. A brief paragraph is given to the Humm-Wadsworth Temperament Scale, a comparatively well known test in industry. Item analysis as a procedure for the selection of test items is nowhere treated. Problems of testing the handicapped, admittedly of contemporary importance, are largely ignored and special test techniques required in public personnel selection are nowhere to be found.

Where the above limitations occur because the text was designed for students and not for experienced personnel workers, the valuations expressed are of course of secondary importance. A serious difficulty, however, regardless of the level of reader intended, is the stress placed upon the difference between aptitude and achievement—innate on the one hand and acquired on the other. This logic forms the framework of the book and creates an unusual emphasis upon aptitude to the exclusion of proficiency in employment testing.

In maintaining this dichotomy, the author is continually forced to such concepts as reaction time, memory, and attention as measurable aptitudes. In the selection of personnel, it is of little consequence whether innate or acquired factors are measured, or what labels are attached to them, if the test instrument permits prediction of the criterion. As a matter of fact, a number of widely-used aptitude tests are actually achievement tests. In this connection it may be pointed out that the field of public personnel selection, certainly within the scope of employment psychology, is almost entirely so-called proficiency testing.

For instructors of industrial or personnel psychology seeking a textbook, this volume is probably the most definitive treatment of the psychology of selection to be found within one set of covers—and more or less attuned to the level of a first course. For this and other commendable reasons it will undoubtedly be found useful in the classroom.

ARTHUR BURTON.

California State Personnel Board.

LEVY, D. M. Maternal overprotection. New York: Columbia Univ. Press, 1943. Pp. xi+417.

A sober attempt to give a true picture of the wide dimensions of the problem of maternal overprotection has led to a unique method of treating clinical data in this book. From a total of approximately two thousand clinical cases passing through the Institute of Child Guidance, twenty cases of pure overprotection were selected by the application of four criteria: (a) excessive contact between mother and child, (b) prolongation of infantile care, (c) prevention of independent behavior by maternal interference, and (d) lack or excess of maternal control. Because of the rigidity of this selection, the author assumes that these twenty children can be taken as truly representative of overprotected children and proceeds to give an intensive analysis of their behavior, their traits, their problems, and later adjustments.

The treatment of the material provides a refreshing contrast to the all too common tendency to select portions from case materials for the obvious purpose of supporting some particular thesis. Very little space is given to theories; instead the ramifications of the mother-child relationship are presented with almost bewildering concreteness.

Levy gives a mass of specific material illustrating excessive contact in such situations as prolonged nursing care, excessive fondling, and sleeping with the mother long past infancy; he illustrates the prolongation of infancy by citing instances where the mother helps her thirteen-year-old son to dress, where she gets bread and water for a twelve-year-old boy, where she puts her adolescent son to bed in the middle of the afternoon as a means of punishing him for some trivial misdeed; he cites instances where the mother actively prevented the child from making any social contacts outside the home; and gives numberless instances of failure of discipline.

As the reader absorbs these many illustrations he comes to the natural conclusion that the trouble lies primarily in the affect hunger of the mother. He is led up to this point of view in such easy stages and is finally introduced to it so tactfully that he finds in himself a sort of feeling that he already knew that this was the answer to the whole situation.

At this point Levy almost undoes his subtle treatment by going into some of the extreme theories about the underlying drives of mother love. However, he gets safely through this morass by discounting these extreme views and takes the reader into the problem of treatment.

The section on treatment is characterized by the same straightforward honesty that permeates the examination of the case materials. He states frankly that direct psychotherapy was uniformly unsuccessful regardless of the number of interviews held or what variations in method were employed by the staff of the Institute. The reader is not unprepared for such a confession, having been led to discern that the mother was so anxious, in most of the cases, to prolong her protection that she would naturally resist any attempt to break her hold on her child. The mothers would not submit to any form of psychotherapy and the only successful methods were those which were carried on without her cooperation. The best treatment was to remove the child from the mother, others were the encouragement of contacts outside the home, the increase of the father's prestige in the home, and home demonstrations of better methods of dealing with concrete situations. The final cure came spontaneously in a number of cases with the maturation of the child.

The experimentalist who reads this book may complain that Levy had no adequate control group against which to check his findings, the statistician will find no statistical validation of the rather frequent use of percentages, and the logician may question the validity of using twenty cases selected in a rather easy manner as representative of a unified class to be designated an overprotected group. But Levy has guarded himself against such criticisms by making no attempt to appeal to any of these three types of persons. He has taken clinical material, subjected it to a screening process, and then has made as near an objective study of the cases who came through his criterion sieve as could well have been done.

John J. B. Morgan.

Northwestern University.

BOOKS AND MATERIALS RECEIVED

Bacon, S. D. Sociology and the problems of alcohol. Memoirs of the section on alcohol studies Yale University No. 1. New Haven: *Quarterly Journal of Studies on Alcohol*. 1944. Pp. 53.

Blum, M. & Candee, Beatrice. Family behavior, attitudes and possessions. Research Study No. 4. New York: John B. Pierce Foundation, 1944. Pp. 209.

Bowley, Agatha H. *Guiding the normal child*. New York: Philosophical Library, 1944. Pp. xv+174.

Callaghan, Jane & Palmer, Catherine. Measuring space and motion. Research Study No. 5. New York: John B. Pierce Foundation, 1944. Pp. 46.

Callender, J. H. Introduction to studies of family living. Research Study No. 4. New York: John B. Pierce Foundation, 1943. Pp. 22.

Fleming, G. W. T. H. (Ed.) *Recent progress in psychiatry*. Special number: The Journal of Mental Science. London: J. and A. Churchill, LTD. 1944, Vol. 90, No. 378. Pp. 509+xii.

Klein, D. B. *Mental hygiene: The psychology of personal adjustment*. New York: Henry Holt, 1944. Pp. xiii+489.

Krapf, E. E. Tomas de Aquino y La Psicopatologia. Monografias de "Index de Neurologiu y Psiquiatria, No. 2. Buenos Aires: R. Orlando, 1943. Pp. 43.

Lepley, R. *Verifiability of value*. New York: Columbia Univ. Press, 1944. Pp. ix+267.

Mann, Cecil W. (Chairman) Postwar educational planning. Progress report of the Commission on Postwar Planning. Baton Rouge: Louisiana State Univ., 1943. Pp. 74.

Salter, A. *What is hypnosis: Studies in auto and heteroconditioning*. New York: Richard R. Smith, 1944. Pp. vi+88.

Sargent, S. S. *The basic teachings of the great psychologists*. New York: Garden City Publishing Co., 1944. Pp. xiv+346.

Sharp, Agnes A. (Ed.) A dynamic era of court psychiatry, 1914–1944. Chicago: The Psychiatric Institute of the Municipal Court of Chicago, 1944. Pp. 149.

ABC's of scapegoating (with a foreword by G. W. Allport.) Chicago: Central YMCA College, Chicago, 1944. Pp. 72.

Science and the future. Essays of the winners of the Westinghouse Science Scholarships in the Second Annual Science Talent Search. Science Service, 1719 N. St., N. W., Washington 6, D. C.

NOTES AND NEWS

News of the death of the following psychologists has been received by the Secretary of the American Psychological Association:

- V. V. Caldwell, Dean, Director General Extension Division, Oregon State System of Higher Education, Portland, Oregon, on November 4, 1943.
- Sidney A. Cook, professor of psychology, New Jersey College for Women, New Brunswick, New Jersey, on February 4, 1944.
- Gilbert V. Hamilton, 824 Moreno Road, Santa Barbara, California, on December 16, 1943.
- Josephine M. Smith, 1413 Salem Hills Drive, Rock Hill Village, Missouri, on May 5, 1944.

Commander Alvin C. Eurich, USNR, who has been on leave from his post as professor of education, Stanford University, has, at the request of the university, been placed on inactive duty by the Navy to enable him to accept the academic vice-presidency of the university. He will continue to serve in an advisory capacity with the Navy.

The John Simon Guggenheim Memorial Foundation has announced the award of Fellowships for the year 1944–45. Among them is an award to Dr. T. C. Schneirla, associate professor of psychology, New York University, and associate curator of animal behavior, the American Museum of Natural History, New York City, for a study of the relationship between instinct and learning in insect psychology. The work will be based chiefly on his study of the behavior of army ants on the Isthmus of Tehuantepec, Mexico.

Wilbert S. Ray, of the department of psychology at Hillsdale College (Hillsdale, Mich.), has been appointed professor and chairman of the department of psychology at Adelphi College (Garden City, N. Y.) and is already in residence at Adelphi.

Ruth White Beebe has been appointed resident psychologist for the Child Study Center of Maryland, with headquarters in Baltimore.

Forrest H. Kirkpatrick, dean of students, Bethany College (Bethany, W. Va.), who is on leave of absence for service with the RCA Manufacturing Company, is now in charge of personnel administration for the seven plants of the corporation. He is responsible for "developing the organized structure, procedures, and policies for the personnel department in each plant and for the over-all coordination and leadership in this field."

Roland L. Beck, director of the demonstration school, Central State College (Edmond, Okla.), has been granted leave of absence for the duration of the war to serve as chief, Research, Testing, and Efficiency Ratings Unit, Office of the Chief of Engineers for the Army, War Department.

Eli Lilly, of Indianapolis, has made a gift of $2500 to the Character Research Fund of Union College. This is Mr. Lilly's second large gift for this project. In 1941 he gave $5000 for the same purpose. The Character Research Project is being conducted under the leadership of Ernest M. Ligon, associate professor of psychology of Union College, and is a cooperative investigation involving the Laboratory of Psychology of Union College, the Westminster Presbyterian Church of Albany, New York, and the First Reformed Church of Schenectady, New York. The first major phase of the investigation has been completed and this gift makes possible the inauguration of the second phase. The Character Research Project is designed to study the roles of all three major institutions involved in character development: the home, the school, and the church.

A. R. Lauer, of Iowa State College, was guest lecturer at the Psychological Museum, 1951 West Madison Street, Chicago, on March 23 and 24, 1944, and gave a series of lectures devoted to psychology in relation to accident prevention. An exhibition of apparatus used to study traffic safety was made. A demonstration of various scientific phenomena of the senses, central processes and response mechanisms was made by David P. Boder, who is director of the Museum, which cooperates with the Illinois Institute of Technology.

The Wichita Guidance Center (Wichita, Kans.), formerly called the Wichita Child Research Laboratory, has issued a general information bulletin describing the Center's history, purpose, types of problems, methods of study, cost of services, methods of referral, board structure, and staff and duties. This can be obtained by addressing the Center at 3422 E. Douglas, Wichita 8, Kansas.

In addition to the regular program of graduate study in speech pathology, the State University of Iowa will feature in its 1944 Summer Session an intensive four weeks' course in Audiometry and Fitting of Hearing Aids from June 26 to July 22. There will be three hours daily of practical laboratory work, supplemented by three hours of lectures. Running concurrently with this intensive course, will be a conference series on Speech and Hearing Rehabilitation each week-end from June 23 to July 22. These conferences will discuss the various phases of speech and hearing rehabilitation in both its civilian and military aspects. For details write Wendell Johnson, Director of the Speech Clinic, at the State University of Iowa, Iowa City, Iowa.

The United States Civil Service Commission has announced that trained occupational therapists are needed in Army and Veterans' hospitals within the United States. While the greatest demand is for experienced graduates of accredited occupational schools, there are some positions for which college training in psychology and in arts and crafts or trades and industries may be substituted for training in occupational therapy schools. The salary range of these positions is $1970 to $2433 a year, including overtime pay. Those appointed at $1970 will be trainees for a period of 18 months; those appointed at $2190 and $2433 will administer occupational therapy under medical and general supervision, in Army and Veterans' hospitals. There are no age limits and no written tests, but applicants must be physically capable of performing the duties involved. Persons now using their highest skills in war work should not apply. Federal appointments are made in accordance with War Manpower Commission policies and employment stabilization programs. Further information on Occupational Therapy Aide positions and forms for applying can be obtained from first- and second-class post offices or from the United States Civil Service Commission, Washington 25, D. C.

The Civil Service Commission of Wayne County, Michigan, announces a nation-wide examination for Psychologist I, to fill a current vacancy in a 4000 bed mental hospital near Detroit. Both men and women are eligible. Minimum requirements include citizenship and graduation from an accredited college or university with a major in psychology. Desirable additional qualifications to be appropriately weighted are a Master's or Doctor's degree and clinical experience. The position pays $2640 to $3120 a year (based on a 40 hour week). In addition to filling the position mentioned, the examination will also provide a list of eligibles for positions as psychologist in a child guidance clinic and in a training school for retarded children within the county. Arrangements will be made for the local examinations of applicants living outside Detroit. Interested parties should write immediately to the Civil Service Commission, 2200 Barlum Tower, Detroit 26, Michigan, for application forms.

Technical Translations Clearing-House. The American Documentation Institute announces the organization and operation of a Technical Translations Clearing-House to supply a service for microfilm and photographic copies of translated articles from foreign psychological journals, and a service for information about existing pools of such translations located at various points in the United States. The Institute requests information from psychologists as to the location of translated materials in foreign psychological journals or periodicals published since the beginning of 1940, either in the personal possession of scientists or in public institutions or commercial collections. The Institute will publish a list of translations available which will be given a wide distribution. Translations will be reproduced at standard copying cost in microfilm or photo copies. Psychologists with translations available or interested in this service should address the American Documentation Institute at 1719 N Street, N.W., Washington 6, D. C.

Boas Memorial Collection at Northwestern University. Northwestern University has recently acquired the collection of books and reprints that constituted the working library of the late Professor FRANZ BOAS of Columbia University. The books and periodical sets number more than 5,000 volumes, while reprints total 10,000. It is planned to make the Boas Memorial Collection, an anthropological reprint center to which anthropologists and those in other fields will be asked to contribute reprints falling with Professor Boas' field of interest. MRS. ALTA GUSAR has been added to the staff of the library as curator of the Boas collection and is at present cataloging and classifying the reprints. The collection is rich in all fields of anthropological concern—physical and cultural anthropology, archeology, and linguistics, according to Professor MELVILLE J. HERSKOVITS of Northwestern. Linguistics is represented by a large collection of grammars of primitive tongues, while samples of primitive art comprise a full representation of materials in the field. Because of Professor Boas' interest in psychological questions, particularly those concerned with racial differences and problems of growth and development, the library is expected to yield much of value to psychologists. It is hoped that those working in this field will forward their reprints to the library. They may be addressed to the Curator, Boas Memorial Collection, Deering Library, Northwestern University, Evanston, Ill.

Research Council at Rutgers. Rutgers University announces the creation of a Research Council to strengthen and promote research throughout the university. A special research fund has been placed at the Council's disposal. Applications for grants are now being considered. The Council contemplates the development of a well-balanced research program in business, the social studies, the humanities and the sciences. The Council consists of nine members, representing various colleges and fields of learning in the University. The Director is WILLIAM H. COLE, professor of physiology and biochemistry, who will serve in a staff relationship to deans, department heads and faculty members concerning research programs, and will represent the university in developing reciprocal arrangements with governmental, industrial, business and professional institutions outside of the university. Emphasis will be placed upon cooperative research between related departments in the university and between outside organizations and university departments.

James McKeen Cattell Grants-in-Aid of Research. The Psychological Corporation offers for 1944–1945 the James McKeen Cattell Grants-in-Aid of Research in Applied Psychology, including industrial psychology, personnel, labor relations, social psychology, marketing, advertising, tests and test construction, morale, public opinion, propaganda, clinical psychology, and the psychological aspects of related disciplines. These grants are primarily available to students who have completed all or practically all course work for their doctoral degree in some field of applied psychology, and whose research projects have already received faculty approval. Post-doctoral applications, however, will also be given consideration. The principal purpose of these grants is to add to research already under way by increasing the scope of the study or by permitting more intensive analysis of the data. For example, these funds may be used to cover expenses such as the hiring of more observers, interviewers or testers; to defray the cost of additional statistical analysis (e.g. make possible the use of punched card equipment); or to pay for additional clerical aid. The grants may not be expended to cover living expenses nor to defray the cost of publication. They may not ordinarily be used to pay for standard laboratory apparatus, books, manuscript materials, or travel to scientific meetings. The amount of each grant is nominally $250. The committee is, however, empowered to increase or decrease the amount of this grant. The closing date for the receipt of applications for 1944–1945 on forms provided by the Grants-in-Aid Secretary is July 15, 1944. Grants will be announced September 1, 1944. Applications will be examined and awards granted by the James McKeen Cattell Grants-in-Aid Committee, which consists of ROSE G. ANDERSON, GEORGE K. BENNETT, HARRY D. KITSON, A. T. POFFENBERGER, WALTER R. MILES, *Chairman*, and ALBERT D. FREIBERG, *Secretary*. Application forms may be obtained from the Grants-in-Aid Secretary. It is requested that application blanks be secured well in advance of July 15, 1944, so that there will be ample time to fill out and return them before that date to the *Grants-in-Aid Secretary, The Psychological Corporation, 522 Fifth Avenue, New York 18, N. Y.*

Notice. A number of members have requested us to reproduce the list of officers of the Association who are in frequent correspondence with members, in the manner in which they appear on page four of the Yearbook. Questions concerning the personnel and the addresses of the Officers and Council Members of the Association frequently arise. Hereafter, as space permits, this list will appear on one of the cover pages of the *Bulletin* and will be kept up to date as changes take place.

Vol. 41, No. 7 July, 1944

Psychological Bulletin

PROGRAM

FIFTY-SECOND ANNUAL MEETING*
of the
AMERICAN PSYCHOLOGICAL ASSOCIATION

Hotel Statler, Cleveland, Ohio
September 11 and 12, 1944

Monday, Sept. 11, Morning Session†

9:00 A.M. *Graduate and Professional Training of Psychologists*, EDWIN R. GUTHRIE, *Chairman*. Open meeting of the *American Psychological Association Committee* on this topic. The agenda follows:

1. Job analysis of the actual functions of psychologists.
2. Licensing and certification.
3. Basic undergraduate preparation.
4. Evaluation of professional work done by psychologists in Army, Navy, or civilian agencies during the emergency.
5. Survey of present training facilities.
6. Regularization of practicum facilities on a national scale.
7. Possible recommendation of department specialization in graduate and professional training.
8. Dissemination of added information about opportunities for professional employment (in connection with the Office of Psychological Personnel).

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* Except for the business meetings on Tuesday afternoon, all sessions will be held jointly with the *American Association for Applied Psychology* and Section I. Psychology of the *American Association for the Advancement of Science*. Professor CALVIN S. HALL of Western Reserve University is in charge of local arrangements.

A central agency has been established by the AAAS for handling room reservations for the Cleveland meetings. Members should address their requests to the *Cleveland Convention Bureau, AAAS Meeting, 1604 Terminal Building, Cleveland 13, Ohio*, specifying 1. three choices of hotels, 2. price of room desired, 3. time of arrival, and 4. time of departure. Members are urged to "double up."

† The Program Committee had hoped to schedule a symposium on Psychology and the War. However, it developed that much of the necessary material was restricted and that some of the participants selected could not attend because of military duties.

10:30 A.M. *Address of the President of the American Association for Applied Psychology.*

ALBERT T. POFFENBERGER. *PSYCHOLOGY: ACADEMIC AND PROFESSIONAL.*

Address of the President of the American Psychological Association.

GARDNER MURPHY. *THE FREEING OF INTELLIGENCE.*

Monday, Sept. 11, Afternoon Session

1:30 P.M. *The Problems and Values of the Proposed Reorganization of Psychological Societies.* ROBERT M. YERKES, *Chairman.*

4:00 P.M. *Special Sessions*

For discussion groups, meetings of special-interest groups, and business meetings of sub-groups. Groups should arrange their own programs, notify their own participants and contact CALVIN S. HALL regarding meeting places.

Monday, Sept. 11, Evening Session

8:00 P.M. *Address of the President of the American Association for the Advancement of Science.* ISAIAH BOWMAN.

Reception of the American Association for the Advancement of Science.

Tuesday, Sept. 12, Morning Session

9:00 A.M. *Psychology and Post War Problems,** CALVIN P. STONE, *Chairman.*

1. Post war psychological problems relating to radio and television, FRANK N. STANTON, *Vice President*, Columbia Broadcasting System.
2. Educational acceleration and post war scientific leadership, SIDNEY L. PRESSEY, Ohio State University.
3. Psychological adjustments of discharged personnel and their families, CARL R. ROGERS, Ohio State University.
4. Occupational and vocational counseling of military and civilian personnel during the period of post war demobilization and the years immediately thereafter, C. L. SHARTLE, War Manpower Commission, Washington, D. C.

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* Organized by Calvin P. Stone and Donald P. Marquis.

5. Expanding opportunities for women psychologists in the post war period of civil and military reorganization, FLORENCE L. GOODENOUGH, University of Minnesota.
6. Opportunities for the expansion of psychological services and research in colleges of agriculture and engineering, H. H. REMMERS, Purdue University.

Tuesday, Sept. 12, Afternoon Session

1:00 P.M. *Business Meeting of the American Association for Applied Psychology.*

2:30 P.M. *Business Meeting of the American Psychological Association.*

In addition to the usual business, the Committee on the Constitution will report recommendations based on the mail vote on the amended By-Laws for whatever action is desired.

Tuesday, Sept. 12, Evening Session

8:00 P.M. *Joint Meeting of Sections I, Psychology and Q, Education, American Association for the Advancement of Science.*

Address of the Vice President of Section Q.

HAROLD CLARK. *HOW FAR IS EXPERIMENTATION IN THE SOCIAL SCIENCES POSSIBLE?*

Address of the Vice President of Section I.

EDWARD C. TOLMAN. *A STIMULUS—EXPECTANCY NEED—CATHEXIS PSYCHOLOGY.*

ELECTROENCEPHALOGRAPHY: REVIEW OF 1942*

RAE GILMAN
Langley Porter Clinic, University of California Medical School

There has been a progressive interest in electroencephalography since its introduction as a practical technique in 1929 in Europe, and in 1934 in this country, until now more than eight hundred articles have appeared on a wide variety of its uses. Some of the general presentations, usually for the benefit of the practicing physician, have been rather over-enthusiastic as to the immediate value of the electroencephalogram in precise clinical diagnosis (**3**, **22**, **58**, **99**), but there have been a number of more conservative summaries of electroencephalograph status in various fields (**1**, **21**, **33**, **76**, **77**, **78**, **79**, **80**, **82**, **83**, **84**, **85**, **86**, **88**, **89**, **90**, **93**, **94**, **95**, **96**, **98**, **100**, **101**). The excellent comprehensive reviews by Jasper, up to 1937 (**91**), Davis, 1937 through September 1938 (**81**), and Jasper, September 1938 through 1940 (**92**) have covered the literature of these periods very fully. Lennox has reviewed the 1941 work on electrophysiology and epilepsy (**45**). The Gibbs "Atlas of Electroencephalography," (**87**) and the chapter by Jasper in "Epilepsy and Cerebral Localization" by Penfield & Erickson (**97**), are outstanding contributions to an understanding of two slightly different interpretations of electroencephalograms.

Electroencephalography is a method of recording the continuous changes of electrical activity in brain tissue by conducting the minute impulses through an amplifying system to an ink-writing or photographic unit where the fluctuations in potential are expressed on a moving tape. An ink-writing oscillograph has obvious practical advantages now that certain mechanical difficulties have been somewhat controlled. It has been accepted that recordings from the scalp are essentially similar to those direct from the cortex, so that in most work small metal discs on the scalp are the electrodes used (**12**). Methods of recording, analysis, classification, and interpretation are still in a state of flux. Bipolar recordings, from two electrodes approximately equidistant from the cortex, and monopolar recordings, with one of the two electrodes over a relatively inactive area, are both used. To indicate general frequency range of waves, the terms alpha, beta and delta are often used, but because of the false sense of precision that this engenders the terms are avoided by some workers. The alpha index, and delta index, based on the percent of time occupied by these waves, and detailed analysis of amplitude are being applied to a variety of material, but there seems to be little evidence of relationships between specific wave types and clinical symptoms, although trends as groups are evident. The use of the Fourier transform to obtain a frequency spectrum is being continued in order to determine quantitative measures on large populations in an effort to establish certain norms (**32**). A similarly motivated attempt to quantify data has been made with the cycloscope, an instrument developed to study short-sequence, quasi-periodic phenomena (e.g. sun-spot cycles) and now applied to the electroencephalograph (**11**). A method has been suggested of graphing results to make them more available for direct comparison with other records, so that the record to be diagnosed may be set against records from verified cases, and by noting the amount of delta activity, and degrees of bilateral difference in it, purely empirical conclusions may be drawn (67).

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* With a supplementary bibliography to September, 1943.

The electroencephalogram (EEG) reflects changes in cortical activity which vary widely during the growth of the individual and the normal shifts of his activities and environment, as well as under abnormal damaging conditions. Fetal EEG's have been recorded in the seventh and eighth months of pregnancy which were similar to post-natal records from the pre-central region of the same individual (49). The increase in frequency and stability of cortical potentials in monkeys which seems to parallel the anatomical and functional growth supports earlier reports on this aspect of developmental changes (41). The cortical frequency spectra of twenty healthy adults as determined by the Fourier transform show that although certain areas tend to beat at particular frequencies, any area can beat with the same rhythm as any other, and that although one area may act as a pacemaker for a given frequency range, the pace-maker effect has no fixed cortical localization and is not constant in behavior. There tend to be variations in energy distribution and in peak frequency between different areas and between homologous areas, with the area having the fastest peak frequency also tending to have the highest peak (32). A driving effect on cortical activity has been demonstrated by intermittent photic stimulation of monkeys, in which the cortical potential amplitude was increased, particularly at 10.5–11 per second frequency, and the rhythm stabilized (38). Simultaneous electroencephalographic, sweating and blood pressure reactions to a variety of stimuli confirm earlier work that beta potentials increase and alpha potentials decrease following stimulation (15).

Variations from approximately 10 per second waves, particularly toward the slower, higher voltage side, are considered abnormal, the exact limits of such abnormality varying according to different investigators. Such a pattern is believed often to be an inherited constitutional inferiority which is non-specific but tends to be associated with instability. The incidence of abnormality in different groups may be reduced by selecting them on criteria which have no apparent relationship to the EEG. For example there is a decrease in the per cent of abnormal records from groups of epileptics, to post-traumatic cases, to psychoneurotics, to Army personnel, to fliers, (74). The abnormal rhythms are also associated with such factors as age, blood flow, blood chemistry (particularly the concentration of sugar, carbon dioxide, and oxygen), presence of drugs, and state of consciousness. These mechanisms and their interrelations are not yet clearly understood.

The possibility that the presence of so-called abnormal slow delta activity may be in part a function of age is brought out by a study of the hyperventilation effects in two hundred diversified records. It is known that the spontaneous cortical activity shifts from large slow waves in infancy to a basic adult rate of approximately 10 per second around the time of puberty. It is now shown that the appearance of delta activity with hyperventilation is also related to age in both epileptic and non-epileptic subjects, the amount of delta decreasing rapidly up to 15–18 years of age, more slowly to 35 years, and showing little change beyond that age. In idiopathic epilepsy, although the amount of spontaneous delta activity is similarly related to age, the absolute amount may vary in different situations (**48**). A period of hyperventilation is usually included in the standard exploratory EEG since it is known that over-breathing tends to induce or accentuate abnormal waves, particularly in epileptic patients. Since lowering the blood sugar may increase the incidence of abnormal waves, it is important to keep it above 120 mg. per cent to eliminate this as an additional variable in comparative or diagnostic studies (**64**). How hyperventilation produces a dysrhythmia remains to be determined, but there is evidence that a tendency to dysrhythmia is related to age (**5**, **48**) and hereditary factors (**46**), with hyperventilation acting to exaggerate an existing dysrhythmia or to release a latent pattern, possibly because of a disturbance of the carbon dioxide regulating mechanism, or an increased sensitivity of cerebral tissue to changes in blood constituents.

Cerebral vasoconstriction, occurring with hyperventilation, seems to be important in the appearance of slow waves, but just how it acts is still debatable. It may be the lowering of oxygen and sugar supplies to the brain, because of the constriction (**17**), or it may be the failure of the vasoconstrictor mechanism to maintain the carbon dioxide at an adequate level (**36**). That vasoconstriction is not the whole explanation is clearly indicated by work on cats in which the injection of an acid causes dilation of the pial arteries and alkali causes constriction, but, unless the pattern is already abnormal, the EEG is not affected by less than near-fatal doses (**52**). The belief that both oxygen tension and blood sugar are important in determining the electrical activity of the cortex is further supported by experiments on cats and rats in which it is shown that the effect of anoxia is greatly increased during insulin shock, and that the tendency to develop slow waves with hypoglycemia can be offset by inhalation of pure oxygen (**31**). Abnormal EEG's have been found in a series of varied cases in which the neuropsychiatric symptoms were attributed to interference with the oxygen supply to the brain, or to inadequate carbohydrate metabolism in the brain (**20**). In Addison's disease the records of many patients showed very slow alpha waves, reduction in amount of beta and unusual sensitivity to hyperventilation, and these characteristics were not affected by most therapy, although adrenal cortical extract and intravenous glucose reduced the sensitivity to hyperventilation in some cases (40).

During various stages of thiamine deficiency in pigeons, the cortical activity showed an initial facilitation of discharge and then depression, somewhat similar to the sequence of changes seen in acute oxygen failure and in insulin convulsions and coma where the mass discharge of the brain is facilitated in the initial phases of metabolic deficiency, before generalized depression of activity occurs. A change toward the normal wave form occurred a few hours after the administration of thiamine, but took ten to seventeen days of normal diet to completely return after extreme deficiency had been produced (69).

The appearance of slow waves has been observed in many types of impairment of consciousness, and has even been suggested as an objective, accurate measure of the state of consciousness, but in several patients with hyperactive carotid sinus reflex it was possible to record an EEG from consciousness to unconsciousness (produced by digital pressure), and back to consciousness again without noting any slow waves. The changes which did occur were toward the faster and lower amplitude records during syncope, and occur in normals and epileptics under similar digital pressure, but are less marked. In another case carotid sinus compression precipitated Jacksonian seizures simultaneously with delta waves in the EEG, suggesting that a local discharge may result from cerebral suppression without being associated with any other cerebral dysrhythmia (55). The incidence of abnormal EEG's is greater among those with hypersensitive carotid sinus reflex than among normals (35, 20). The variation of results concerned with syncope indicates that it is not a simple mechanism, and there are undoubtedly several different types which have not yet been recognized.

Patients with uncomplicated migraine have normal EEG's when headache free, but during attacks they show changes after hyperventilation. Histamine induced headaches were not found to be associated with abnormality in the EEG (68).

Some previous investigators had suggested that an enhancement of the basic alpha rhythm followed the use of sedatives, but in a recent study on young dementia precox patients this was not seen after the intravenous injection of sodium amytal. Instead there was a shift to approximately 20 per second waves, which is not specific for barbiturate derivatives, but is a general component of early "depressed" cortical activity (14).

A single dose of morphine in a normal individual has no appreciable effect on his cortical activity, but in addicted and in post-addicted groups the alpha per cent distribution curves differ from those of the normal groups, tending to show a high per cent-time alpha (2).

The practical value of the electroencephalograph in clarifying the diagnosis of epileptiform seizures and in judging the efficiency of treatment has made it a routine test on such patients at a number of clinics, despite the fact that there does not seem to be a specific pattern pathognomic for any type of seizure (26, 74). However, a very high proportion of these cases show slower than normal waves, particularly under the influence of hyperventilation. The mechanism whereby the ketogenic diet may reduce seizures in some epileptics is still uncertain, but it seems to have a parallel effect on the EEG. In a small group of epileptic children the "epileptic" waves were eliminated in those who showed clinical improvement and no change occurred in those not affected (51). A study of twins adds further evidence to the theory that the electroencephalographic pattern is an inherited feature which may be modified by environmental factors such as injury and disease. In identical twins the patterns were similar, and in those cases where only one twin had epileptic attacks, it was found that both had abnormal records but that the epileptic twin also had a history of some possible brain injury (46).

Certain choline derivatives, particularly acetylcholine chloride, produce a marked increase in electrical activity when applied directly to the cortex, and the degree of activity seems directly related to the stability of the solution in the presence of cholinesterase which tends to hydrolyze acetylcholine rapidly. It is speculated that the mechanism and etiology of convulsive seizures in humans may be related to disorders in the metabolism of acetylcholine which is a normal brain constituent, but which acts as a convulsant in larger quantities (4).

Pyknolepsy has been considered distinct from epilepsy, but careful consideration of its nature from various viewpoints has led to the conclusion that it is a form of petit mal because of the similar clinical picture, the wave-and-spike form appearing in the EEG in both, the lack of evidence of definite psychogenic factors in pyknolepsy, and the high incidence of epilepsy in families of pyknoleptic patients (59).

In studying the pathogenesis of chorea it was found that the cortical potentials tended to be irregular, but were not specific for the disorder. It was concluded that the choreiform movements originate at the level of the cerebral cortex, congenitally or because of lesions in the pathways normally modulating the activity of the cortex (8).

A high percentage of eclamptic women show a cerebral dysrhythmia and many of these also had a family history of convulsive disorders, suggesting that this is another example of an inherited dysrhythmia exaggerated to the level of a clinical seizure, in this case by the associate toxemia (53). Similar evidence is suggested in cases of Paget's disease with convulsions which show abnormal EEG in themselves and in near relatives, whereas the patients without convulsions did not have abnormal records (57).

Further reports on the effects of specific intracranial pathology on the EEG do not show any definite pathognomic patterns, although there does seem to be a relationship between the extent of the lesion and the degree of electroencephalographic abnormality (**66**, **10**, **18**, **9**, **42**). When experimental lesions were produced in the cerebral cortex and basal ganglia of monkeys, at least a temporary flattening and slowing of the medium frequency waves appeared post-operatively, which was more prominent after larger lesions. Marked changes, particularly the appearance of hypsersynchrony, occurred after lesions of the head of the caudate nucleus and/or the putamen, but the greatest effect was produced by combined lesions of the motor cortex and basal ganglia. If these lesions were produced in infancy, more extreme changes occurred in the EEG (**42**). The immediate effects of concussion on the cortical potentials and on the lower reflexes of cats led to the conclusion that "concussion is the direct result of mechanical violence to cerebral cells" and is not dependent on secondary changes such as edema, anoxia, or hypoglycemia. The concussing blow reduced or stopped entirely the electrical activity of the whole cerebrum, followed by the delayed appearance of abnormal slow waves similar to those seen after concussion in man. With local trauma the electroencephalographic changes were limited to the injured area, but they were similar to those of generalized concussion (**75**). The post-concussion syndrome in man probably has an organic basis as indicated by the relatively frequent occurrence of abnormal EEGs in these cases (**54**).

Conflicting studies on the effect of increased intracranial pressure led to experimental work on cats, dogs and monkeys in which a rapid increase in pressure was produced, directly through trephined openings, to levels above those encountered in clinical practice. The effect on the electrical activity of the cortex seemed to depend on the relationship of blood pressure and intracranial pressure, there being no correlation between the absolute level of intracranial pressure and the electroencephalographic changes. This suggests that the effects of acute intracranial pressure are the result of impairment of blood flow, rather than an effect of the pressure per se (**29**).

The changes in cortical potentials of frogs' brains under the influence of curare (**23**) and of heat (**24**), suggest that a reversible brain narcosis may be produced by these means, and that the peripheral and central actions of these agents are independent of each other.

An extensive study of the electroencephalograms in cases of neurosyphilis shows 50 per cent of them abnormal, as compared with 7 per cent abnormal in the control group. Treated cases showed fewer abnormal records, the clinically most severe group were most apt to have abnormal records, and clinical and electroencephalographic improvement were parallel, but there were no specific patterns observed which might be of diagnostic significance. The records of all types tended to be symmetrical, whether improving or deteriorating, suggesting a pacemaker action. Since pure tabes, dementia paralytica and optic atrophy showed a similar per cent of abnormal EEG, it is suggested that lesions in the upper brain stem and base of the cerebrum may be more influential than cortical lesions in producing abnormal potentials, possibly through influencing a pacemaker in this area. It should be noted that a normal EEG does not rule out the possibility of a cortical lesion (27, 28).

No absolute correlation has been found between the EEG and the clinical observations of a number of patients with common organic psychoses, although there is a significantly higher per cent of abnormal records in such a group that in the normal population. The presence of 1–5 per second waves may be of some diagnostic value in organic psychoses, but a normal record does not exclude an organic basis for the disorder (39). The neuropsychiatric sympsoms of some generalized diseases may be due to interference of oxygen or sugar supplies to the brain, or to inadequate carbohydrate metabolism in the brain tissue. Cases with cerebral anemia, anoxemia, and disturbed carbohydrate metabolism showed abnormal EEGs, chiefly slower frequencies, along with their clinical symptoms (20).

In comparing pneumoencephalograms and electroencephalograms from a group of non-focal neurological disorders, no direct correlation of abnormality by the two methods was found, although there was some indication that slow activity was common and rapid activity uncommon in cases with dilated ventricles, but it is quite evident that the electroencephalogram is an adjunct, not a substitute for the pneumoencephalogram (71).

Studies are underway to correlate flying ability with the electroencephalogram, but there is nothing conclusive on this yet (70). Attempts to link the IQ with the electroencephaographic pattern have also been inconclusive to date (43).

The cessation of alpha waves when a patient attempts to look at an object, though claiming not to see it, may be taken as an indication of hysterical or malingering blindness, and the persistence of the alpha rhythm would indicate an organic type. This also suggests that hysteria does not involve the sensory or motor pathways or their primary cortical centers (44).

The electroencephalogram has not yet been proven of specific value in the diagnosis of mental disorders, although a variety of studies have all seemed to indicate that the per cent of abnormal records in such groups is significantly higher than for control groups. The chief value of the EEG in the usual mental hospital seems to lie in picking out the probable epileptics and those with definite organic disorders (73).

Among the others the outstanding characteristic is their variability—between cases and within records. This has been particularly true in the studies of schizophrenics. Earlier studies had suggested that schizophrenic and epileptic patterns were related, but since the idea of a specific epileptic pattern has been largely discounted by finding the so-called "epileptic pattern" associated with other clinical conditions, various attempts have been made to discover a "schizoid-type" pattern. When ranking EEGs according to a five point stability scale, a significantly greater per cent are border-line or abnormal records among the schizophrenics than among normal control groups (based on 500 schizophrenics, 215 controls) (25). The catatonic-hebephrenics have the greatest per cent of abnormal records among the clinical divisions of schizophrenia (25, 56, 73). One attempt has been made to examine the relationship between the activity of the hypothalamus and cortex with varying conditions under which the schizophrenic may break down and show deviations from the normal, instead of confining the study to cortical activity with the subject at rest. The response of schizophrenics, as recorded in the EEG via basal and cortical leads, is markedly lacking in the excitation reaction produced in normals and neurotics by external cold, intramuscular adrenalin, electrical stimulation of the hypothalamic region, and verbal stimulation. It might be that "the deficiency in hypothalamic activity throws the stress of adaptation into the motor field" and that this accounts in part for the schizophrenic behavior. (37)

Manic-depressives showed normal records with no characteristic shift in the EEG accompanying the mood changes (73), unless the level of consciousness was impaired (16).

Electroencephalograms taken in conjunction with seizures induced by electricity, metrazol, and insulin, show abnormal patterns which somewhat resemble those of many epileptics, and which tend to disappear with time. The degree of variation and persistence of these changes seems directly related to the pre-shock record as well as to the number and severity of the seizures (47, 60, 61). When minor attacks were induced the transient appearance of random activity and slower and faster waves in the record were closely associated with the clinical loss of consciousness, resembling petit mal, but without the appearance of wave-and-spike patterns in the record. Even large series of these minor shocks did not produce alterations in the EEG persisting for more than twenty-four hours. When major, generalized convulsions were induced, the record showed marked changes which were more extensive and persisted longer when more shocks were given, but which tended to disappear within six months. In considering the advisability of shock therapy, it should be kept in mind that in some cases the cortical changes, as reflected in the EEG are still present after six months, that if the pre-shock pattern is abnormal a longer time is necessary before the pattern resumes its pre-shock state, that the clinical signs after shock are of an organic type of sensorial and intellectual impairment, and that spontaneous seizures are known to have developed after such therapy. It should also be noted that clinical improvement is not directly related to the presence of changes in cerebral function as demonstrated by the electroencephalogram. Electric shock produces more severe changes in the record and in intellectual functioning that does metrazol, although the incidence of patients showing changes is similar with both types of shock. It may be that an abnormal pre-shock EEG contra-indicates shock therapy. The mechanism of the therapeutic effect of shock treatment is still very much in the realm of speculation, but the electroencephalograph offers an objective measure of one area in which demonstrable changes occur.

The influence of drugs on personality functions and on the cortical electrical activity in schizophrenics showed only slight correlations when mescaline and sodium amytal were given. Electroencephalographic changes were always associated with psychological changes, but psychological shifts occurred without affecting the electroencephalogram. There seemed to be a tendency for the effect to be characteristic of the patient, rather than of the drug (63).

In less extreme cases it is becoming more apparent that there is also some relationship between the cortical activity and the personality structure, but what this relationship may be is certainly not clear. In a group of grossly normal adolescent boys, variations from the "normal" frequency of approximately 10 per second tended to be associated with either "good" or "poor" personality, with unusually slow activity more often found among the "poor" personality group, and unusually fast waves among the "good." This is in keeping with previous studies on children, where slow activity tended to occur more frequently in those whose behavior was socially undesirable (30).

Other approaches have been made in which the percentage of alpha waves present is given more consideration than the frequency of the dominant rhythm. Previous studies had suggested a correlation of dominant alpha records with passive, receptive, dependent personality types, and among manic-depressives a slight tendency for dominant alpha to be associated with the depressed phase, and rare alpha with the manic phase (16). In a study of peptic ulcer patients the electroencephalographic evidence supported the impression gained from the personality studies that such patients differ from the normal population in their personality structure. A control group showed a normal distribution curve of the alpha index, but the peptic ulcer group showed peaks at both the low and high ends of the distribution curve for the per cent of alpha present, with three and one half times more dominant alpha records than in the normal group. The value of this study lies particularly in indicating the way in which a number of approaches can be used in evaluating the factors in somatic disorders and in studying personality in general (**62**).

On the whole the recent studies on behavior disorders have tended substantiate earlier studies. The per cent of abnormal EEGs found in problem children ranges above 60 per cent in small groups (**6, 7, 19**), and in a large number (339) of adult prison inmates is twice as great as in a control group (**34**). There was a higher per cent of abnormal records, and greater response to hyperventilation, among behavior problem children than among normals, and when they were divided into four age groups between four and eighteen years of age the same relationship existed at all age levels, but the largest absolute amounts of abnormality were found consistently in the records from the youngest group, and progressively diminished with age. This is compatible with the concept of maturation as a factor in the occurrence of abnormal slow waves, and possibly with behavioral disorders. In this sense the EEG may possibly offer an objective measure of physical immaturity of the brain (**65**). The practical value of such findings may lie in determining therapy. Medication is sometimes helpful, such as benzedrine and dilantin (**7, 50**). However, there may be definite improvement in behavior without any significant changes in the electroencephalographic abnormalities (**7**).

Electroencephalography is still in the descriptive stage, and still in need of developing standardized techniques and classifications before adequate interpretations and explanations can be attained. Much more work on clinically normal groups must be done in order to establish a basis for the diagnosis of abnormality.

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POST-COLLEGE VOCATIONAL ACTIVITIES AND ATTITUDES OF PSYCHOLOGY MAJORS

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This is an attempt to consider the role the study of psychology plays in the vocational and personal life of University of Illinois alumni who have received a bachelor's degree in liberal arts with a major in psychology. The problem was begun and carried out as a co-operative research activity of the University of Illinois chapter of Psi Chi.* While the original purpose of the investigation was to obtain first hand information for the members of the local chapter of Psi Chi, the problems of students of psychology and their teachers in different institutions would seem to be sufficiently similar to warrant making the data available generally. That elementary courses in psychology have received considerable interest and attention is indicated by the popularity of symposia on the teaching of psychology at national and regional meetings, as well as by the comprehensive bibliography included in Wolfle's review on *The First Course in Psychology* (3). The present study is concerned with the reactions of former psychology majors to all the courses in psychology they took as undergraduates, the extent to which their present vocational activities are related to their major study, and their attitudes toward psychology. Such information should be of value both to students who contemplate majoring in psychology, as well as to those who teach them.

To show that the undergraduate courses offered by the department of psychology at the University of Illinois are fairly typical a comparison can be made with those offered by other colleges of liberal arts. The University of Illinois listings during the years 1932–1940 include every course offered at 35 per cent or more of the institutions included in Henry's (2) survey of undergraduate courses in psychology except for a course in Tests and Measurements and a course in Statistics, which are given locally by another department or college. Following is a list of the 22 undergraduate courses, totaling 56 hours, given at the University of Illinois during this period: Introduction to Psychology (4 cr.); General Psychology (Fields of Psychology)(4 cr.); Laboratory Practice (Elementary) (2 cr.); Mental and Physical Work (Industrial Psychology) (2 cr.); Social Psychology (3 cr.); Character and Personality (3 cr.); Physiological Psychology (not given 1932, '33, '37) (2 cr.); Minor Problems (Advanced Laboratory—not given 1932, '34) (3 cr.); Psychological Aesthetics (added 1937; not given 1938) (2 cr.); Thesis and Honors Course (2 cr.); Psychology of Motivation (2 cr.); Comparative Psychology (3 cr.); Feeling and Emotion (not given 1932–2, 1937, 1939) (2 cr.); Learning and Comprehension (2 cr.); Genetic

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* While many members participated, particular recognition should be given to Joseph F. Zygmunt, president, Mrs. Eva S. Teppert, and Glen A. Brackbill. Sarah Martha Watson, research chairman, studied the data and summarized it. Hilding B. Carlson, faculty advisor, supervised the project.

Psychology (until 1937, 2 semester hours) (3 cr.); History of Psychology (given 1933, 1937) (2 cr.); Perception (not given 1937; until 1932, 3 semester hours) (2 cr.); Systematic Psychology (2 cr.); Abnormal Psychology (3 cr.); Recent Experimental Problems (Psychology of Thinking—given 1933, 1938; summer, 1938, 2½ semester hours) (2 cr.); Individual Differences (3 cr.); Student Personnel Work (added 1938) (3 cr.).

The minimum requirements that individuals must meet as undergraduate majors in psychology are 120 semester hours, with an average grade of C, including 20 semester hours in psychology beyond the *Introduction to Psychology.* The psychology courses represent, then, at least 20 per cent of the total hours necessary for the bachelor's degree.

A blank questionnaire form, called an inventory, and an accompanying letter were mailed in the autumn of 1941 to each individual who had graduated during the years 1932–1940 with a major in psychology and for whom an address could be obtained. Sixty-two, or 35 per cent, of the 176 individuals assumed to have received the inventory filled it out and returned it by mail.

Age and sex. The distribution of the individuals at the time of the investigation according to date of graduation, sex, and age is shown in Table I. The maximum time interval intervening between graduation and this investigation is 9 years, the minimum 1 year, and the mean slightly over 3 years.

TABLE I

DATE OF GRADUATION, SEX, AND PRESENT AGE OF THE INDIVIDUALS WHO RETURNED COMPLETED INVENTORIES

Date of graduation	Sex Male	Sex Female	Present Age range	Median age	N
1932–3	2	3	28–33	30	5
1934–5	2	2	25–28	26.5	4
1936	2	3	25–27	26	5
1937	5	1	25–29	26	6
1938	8	5	23–30	25	13
1939	2	8	23–33	23	10
1940	8	11	20–29	22	19
N	29	33	20–33	25	62

Marital status. Ten of the 29 men and 16 of the 33 women were married. Three of the men and 5 of the women had children.

Postgraduate training. Thirty-three, or 53 per cent, of the individuals had taken or were taking some additional training beyond the bachelor's degree. Fourteen of these had already received graduate degrees. Ten stated that they had received or were receiving additional training in psychology. Four gave medicine as their postgraduate study, 3 theology, 2 social administration, 2 commerce, and 1 each law, interior decorating, engineering, and nursing. Eight failed to specify any field of concentration. Thus, at least one-third of those who took graduate work did so in psychology.

Present occupation. Table II lists the occupations and salary ranges of these individuals. Thirty-nine, or 63 per cent, were engaged in activities involving some monetary recompense. Excluding the individuals in the Army, salaries ranged from $700 to $3500 per year, the median being $1312.50. On the basis of a nationwide study (1, p. 65) of the income of college graduates covering the years 1928 to 1935, the median salary of these former psychology majors is about equivalent to the median salary for women who have been out of college for about four years, and about $300.00 less per year than the median salary for men who have been out of college for a like period. The range of tenure in

TABLE II

Occupation and Income When the Inventory Was Returned

Occupation	Sex M	Sex F	N receiving income	Income range (yearly)
Army service	1		1	$330*
Business	3	4	7**	800–3300
Housewife		10		
Instructor, college (psychology)	1		1	1400
Instructor, nurses (psychology)		1	1	1200
Librarian, hospital		1	1	1200
Minister	2		2	1200–1400***
Naval Air Service	1		1	2460
Personnel Classification, Maritime Commission	1		1	3500
Physician	2		2	1200–1800
Principal, High School	1		1	1800
Psychologist, clinical	1	1	2	1000–1314*
Public opinion survey	2		2	1800–2268
Railroad traffic agent	1		1	2580
Secretary		3	3	1000–1400
Social worker	3	3	6	1200–2100
Student	7	5	2	700–1200
Teacher, public school	2	3	5	810–1535
Unemployed	1	2		
N	29	33	39	330–3500

* With maintenance.

** Two individuals failed to report incomes.

*** With house.

the present position was from 1 to 84 months, the mean being 24 months.

The individuals obtained their present positions through a variety of means. Seven secured their present positions through members of their family or friends, 7 through employment agencies, 7 by means of personal interviews, 5 through promotions, 4 through applications, 3 each on the basis of competitive examinations and merit, 2 by contacts made in college, and 1 was drafted into the Army.

Two persons among the 39 who were gainfully employed did not reply to the question, "Do you like your present position?" Three replied "no." Two of these 3 stated they did not have sufficient desirable opportunities for advancement in terms of financial, social, and professional status, or opportunities for personal satisfaction. Of the 34 individuals who answered "yes," 19 were satisfied with their opportunities for financial advancement, 18 with the prospects for social advancement, 16 with the promise of professional advancement, and 27 said their position provided sufficient opportunities for personal satisfaction.

The questions concerning the value of college training in the individual's present position were answered by students and housewives, as well as by those holding positions with salary. The replies of the entire group will be considered.

Of the 62, 12 (6 housewives, 3 students, and the 3 unemployed) failed to answer the question, "In what way is your present position psychological in nature?" Five replied negatively with comments such as the following:

> Stenographer: "In no way."
>
> Business employee: "In no way except considering my contacts with customers."

Forty-five, or 73 per cent, described their present activities as psychological with replies such as these:

> Minister: "Any minister seeking to minister to the needs of the present generation finds his job psychological in the main—sometimes almost one of dealing with pathological cases."
>
> Secretary to a women's employment manager: "I do some interviewing of applicants and am constantly dealing with large numbers of people within and outside the company. I also do some testing, and a great deal of confidential personnel work."
>
> Housewife: "I consider being a wife and mother as a position psychological in nature."

Five of these 45 were employed in strictly psychological positions. They include a college instructor in psychology, a nursing instructor in psychology, two clinical psychologists, and an assistant chief of personnel classification in the Maritime Commission. Four others were graduate students majoring in psychology. Thus only 8 per cent of the total group were working in positions where their job classification is that of psychologist, with an additional 6 per cent presumably preparing to function as such. Psychological work is felt, however, to extend beyond the limits of professional psychology, as is indicated in the comments quoted.

Of the 17 individuals who implied that their activities were not psychological, eight gave no reply to the question, "Is the training you received in psychology at the University of Illinois of value to you in your present position?" Two replied that it was useless, 2 that it was helpful, and 5 that it was valuable. Of the 45 who considered their position psychological in nature, 11 stated that their psychological training was helpful, 24 valuable, an 10 indispensable. Thus, only 2, or 3 per cent of the total group, believed that their training in psychology was useless, while a total of 52, or 84 per cent, believed that their psychological training was helpful, valuable, or indispensable in their present vocational activities.

Twelve, or 19 per cent, of the individuals did not answer the question, "What other subjects which you studied at the University of Illinois are of value to you in your present position?" One person replied "none" to this question. Two of the remaining 49 listed "all of them" as being valuable. The remaining 47, or 76 per cent, named courses in 1 to 6 college departments, the average being slightly over 2 departments. The frequency of mentions, from the most to the least, were sociology, English, education, philosophy, mathematics, physiology, chemistry, and physics. All other college departments were mentioned less than five times. The frequencies are probably related to the frequency with which the courses were elected by these individuals while in college.

Previous occupations. Twenty-seven individuals reported that they had held a total of 43 positions following graduation and prior to their present activities. Thirteen of these held 1 position only, 12 held 2, and 2 held 3. The positions reported, from most to least frequent, were social work, office work, professional psychological work, business administration, teaching, selling, research, librarian, camp counseling, and clerking in a bank.

Twenty-two of the 43 previous jobs had been obtained through applications and interviews; 5, by means of personal contacts or acquaintance with the employer; 4, by offers from the employer. The remainder were obtained in a variety of ways. It is apparent from these facts, and from those reported in connection with the present positions of these individuals, that the psychology majors studied have relied largely upon their own initiative in obtaining jobs.

The salaries of these previous positions ranged from $1.00 per hour for occasional work to $3000 per year. The quartiles were $780, $1020, and $1200 per year. Only two incomes were above $1800 per year: $2600 and $3000, listed by the same individual as incomes from business. Five positions were listed without corresponding salary.

Of the 43 previous positions, 21 were reported as not being psychological in nature. Sixteen were not professional psychological positions but were considered to involve psychology to some extent. These included social work, teaching, camp counseling, research statistician, secretary, business, and selling. Six of the positions were recognized as being professional psychological work, and included testing, counseling, clinical work, research, and teaching.

The minimum tenure of these previous jobs was 1 month, the maximum 72 months, with the mean approximately 15 months. This average tenure is based on only 40 jobs, since the duration of 3 of them was not specified.

Numerous reasons were given for leaving the former positions. Eleven positions were of a temporary nature and the jobs discontinued; 8 were abandoned to obtain better positions elsewhere; 5 jobs resulted in promotions; 4 women resigned from their jobs to be married; 4 positions were given up because of dislike for the work; and in 3 cases the individuals returned to college for graduate study. One person was dismissed with no reason given. The remaining jobs were discontinued for sundry reasons.

In summary, 44 per cent of the individuals included in this survey had held paying positions previous to their present vocational activity. Forty-nine per cent of the former positions were non-psychological in nature, 37 per cent were somewhat psychological, and the remaining 14 per cent strictly psychological. The median salary was slightly over $1000 per year, and the jobs were, for the most part, either temporary jobs in themselves or a place for marking time until something better or different appeared. The jobs were obtained chiefly by applications and personal contacts outside the University.

Goals. In reply to the question concerning goals, "Before leaving the University of Illinois did you have a fairly clear conception of the work you wanted to do?" 45, or 73 per cent, answered "yes."

Thirty-one, or 69 per cent, of these 45 persons reported difficulties in finding their chosen occupation. Seven, or 16 per cent, reported no difficulty and 7 gave no reply.

Of the 31 who reported difficulties, 8 reported financial difficulties in achieving their goal, 7 said they had insufficient training for their chosen occupation, 6 that they could not find work, 3 that they were inexperienced in the work they wished to do, and 7 for sundry reasons.

In answer to the question, "How did these difficulties cause you to alter your goal?" 18 of those who had met with difficulties indicated that their goal had not been altered, 11 said that their goal had been altered by the difficulties encountered, and 2 made no reply.

Of the 11 psychology majors who had fairly clear aims when they left the University but who changed their goals, 7 women had made homemaking their goal, 2 individuals were undecided, 1 individual wished to be a C.P.A., and another intended to teach and do research in psychology.

Sixteen reported that they had no clear goal when they left the University. All but one now reported a goal. Two each wanted happy homes, good positions and good salaries, positions as high school principal, psychiatric social work, and psychological work. Psychiatry, law, retail store manager, interior decorator, and advanced academic training were each indicated once.

Fifty-six, or 90 per cent, of the individuals now had fairly clear cut goals. Fifteen persons were classified as having socio-economic goals; 9 giving marriage and motherhood, and 6 such ambiguous statements as good position, financial stability, satisfaction from job, and the graces of living. Thirty-eight individuals specified professional or occupational goals, 18 of whom were already working at their chosen vocation and desired to advance therein. A need for further academic or professional training was indicated by 7 of these 18. The remaining 20 gave specific vocational goals, but were not engaged in the kind of work they named. Further academic training or occupational experience was named by 18 of these 20 persons as necessary to obtain work in their chosen occupation. Three individuals indicated only academic goals, 2 of them designated as doctor's degrees in psychology.

Fourteen, or 37 per cent, of those who specified professional goals named some form of strictly psychological work. If the two individuals who desired doctor's degrees in psychology are included, about one-fourth of the total group who responded to the inventory professed specific psychological positions as goals.

To the question, "On the basis of your experience, what do you think are the occupational opportunities for psychology majors at the University of Illinois?" 17, or 27 per cent, gave no reply or said "I don't know." The remaining 45, or 73 per cent, gave 106 suggestions, from 1 to 5 per individual, the mean being 2.4.

Of these 45 individuals, 23, or 51 per cent, stated that without an advanced degree the opportunities in psychology are limited, small, or nil. Others implied the need for graduate training by naming professional opportunities which require graduate degrees. Personnel work in industry and school was indicated by 13 persons; civil service and psychometrics were each mentioned by 8; institutional work by 7; teaching psychology by 6; research in psychology by 5; and child psychology by 1.

Eleven persons mentioned occupational opportunities in related fields. Five named public school teaching; others named psychiatry, social work, and medicine.

In general, the individuals indicated that their experience in various professional fields of psychology or related work had been hindered by the lack of further training beyond the bachelor's degree.

Reasons for choosing psychology as a major. Several questions related to reasons for majoring in psychology and to the subsequent expediency of that choice.

In the most comprehensive of these questions, the individuals were asked to reply to the following series of inquiries as to their reasons for choosing psychology as their major: "as training in professional work in psychology," "as supplementary training for other fields," "because of general interest," "as an aid in own personality problems," "because of a desire to understand others," and "other reasons."

All except 1 of the 62 individuals responded in some manner to at least one of these reasons. This one individual is not considered with the others because he made no evaluations and merely wrote that he studied psychology because of "interest in the subject." Those who checked the indefinite "other reasons" also checked at least one specific reason. Three persons checked all 6. The mean number of reasons designated per person was 3.62. The replies are summarized in Table III.

TABLE III

Reasons for Choosing Psychology as a Major and Judgments of the Adequacy of Undergraduate Courses to Meet These Reasons

	Number of judgments							
	Indispensable	Valuable	Helpful	Useless	Detrimental	N judges	Per cent of judges	Mean judgmental value
	+3	+2	+1	0	−1			
As training in professional psychology	18.5	14.5	4.5	1	.5	39	63	2.29
As supplementary training for other fields	9.5	21.5	7.0			38	61	2.06
Because of general interest	15.5	22.5	13.5	.5		52	84	2.02
As aid in own personality problems	7.5	18.0	16.0	1.5		43	69	1.73
Because of a desire to understand others	12.0	18.0	13.0	1		44	71	1.93
Other reasons		4.0	1.0			5	8	1.80
N judgments	63.0	98.5	55.0	4.0	.5	221		
N judges	36	45	35	4	1			
Per cent of all judges	58	73	56	6	2			

Fifty-two, or 84 per cent, of the individuals checked "because of general interest" as one of their reasons for choosing psychology as their major. Forty-four, or 71 per cent, gave "because of a desire to understand others," 43, or 69 per cent, "as an aid in own personality problems," 39, or 63 per cent, "as training in professional work in psychology," 38, or 61 per cent, "as supplementary training for other fields," and 5, or 8 per cent, "other reasons."

Fourteen reasons in addition to those in Table III were named by 30 individuals for selecting psychology as their major subject. Nine chose psychology because they received better grades in psychology than in other subjects, 6 because of the mystery surrounding the word psychology, 4 because they enjoyed the subject, and 3 to round out their education. The remaining reasons were individual.

Extent to which psychology courses met the reasons given for choosing psychology. At the same time that the individuals indicated their reasons for choosing psychology, they were asked to indicate the extent to which they considered the courses in psychology satisfied these reasons.

Some were unable to evaluate the psychology courses they had taken in any one of the columns *indispensable, valuable, helpful, useless*, or *detrimental*. For example, a medical student qualified his judgment of the courses in psychology for training in professional work in psychology as "Indispensable if I go into psychiatry, otherwise valuable." A high school principal rated the courses in psychology between *helpful* and *useless* as a subject of "general interest" and as an "aid in own personality problems." In tabulating the data, each response of a double judgment was given equal weight by counting each such response as one-half, and each single judgment as one. On this basis, there were a total of 221 judgments, the gross number being 235. The maximum gross number of judgments by any individual to all 6 reasons listed in Table I was 8, the average being 3.9.

Forty-five, or 73 per cent, of the individuals rated the psychology courses as *valuable* in one or more respects. Thirty-six, or 58 per cent, regarded them as *indispensable*, 35, or 56 per cent, as *helpful*, and 4, or 6 per cent, as *useless*. Only one individual, an elementary school teacher, evaluated them as *detrimental*. However, at the same time, she checked *indispensable*, and accounted for her judgment of *detrimental* by commenting, "One board of directors thought psychology a lot of nonsense."

None of the five individuals who rated the courses in psychology as *useless* or *detrimental* did so in all respects. All 61 persons evaluated them as *helpful* or better in one or more respects.

In order to obtain a rough index of the extent to which the courses satisfied the various reasons for majoring in psychology, a comparison was made between the frequencies of judgments in each category. To obtain such an index, the value 0 was given to the judgment *useless*, −1 to *detrimental*, +1 to *helpful*, +2 to *valuable*, and +3 to *indispensable*. The mean values thus obtained are included in Table III.

The individuals who majored in psychology for training for professional work in psychology ranked the courses in psychology highest with a mean of 2.29. Those who majored in the field for its supplementary training for other fields judged the courses next with a mean evaluation of 2.06. The individuals who stated they studied psychology because of general interest had a mean score of 2.02. This average score of *valuable* might be interpreted as indicating that, while psychology as a Liberal Arts and Science subject satisfied the cultural interest of these individuals, it was only one of the subjects which did so. Those who majored in psychology because of a desire to understand others had a mean judgment of 1.93, while those who took psychology to help solve their own personality problems had the lowest mean score, 1.73. From these data, the inference might be made that the undergraduate psychology courses were considered of greater value for training in professional psychological work than in giving insight into the individual's own personality problems. While no attempt was made to determine the statistical reliability of the differences between the mean scores, the inference made from these differences is consonant with frequent remarks made by students in personal conversation with the authors.

TABLE IV

REPLIES TO THE QUESTION, "HAVE PSYCHOLOGY COURSES AT THE UNIVERSITY OF ILLINOIS HELPED YOU?"

	Yes	No	No reply
In your marital life?	24		38
In your parental life?	14	2	46
In your relations with friends and associates	45	8	9
N	83	10	93

However, there is other evidence to show that the courses in psychology at the University of Illinois were of some practical personal value. This is indicated by the replies of 53 individuals, as given in Table IV, to the question, "Have psychology courses at the University of Illinois helped you in (a) your marital life, (b) your parental life, and (c) your relations with friends and associates?" Forty-eight answered some part of the question positively, while 5 gave only negative answers. It is interesting to add that 88 per cent of those who were married indicated that the courses in psychology had helped them in their married life. While many omitted answering parts of the question, others indicated their uncertainty by recording question marks.

The field of specialization if the graduates were to start college again. In reply to the question, "If you were to start your college career over again, in what field would you major?" 34 individuals, or 55 per cent, named psychology. Two of these qualified their answers by specifying aspects of the field that they would emphasize to a greater extent than they did, and a third wrote that she would get a bachelor's degree in psychology but would not do graduate work in the field. Seven others named psychology as their choice, but qualified it by naming some applied fields beyond the scope of formal psychology as such. Thus, a total of 41, or 66 per cent, of the individuals would again choose psychology or some applied field. Five others mentioned medicine as their choice, 4 commerce, 2 engineering, and 1 each bacteriology, economics, English and speech, mathematics and education, philosophy, secretarial work, sociology, and sociology and education and law. Two individuals commented that the major subject made no difference.

It is apparent that some individuals felt the need for technical or professional training in some field. This is shown by the fact that 19, or 68 per cent of the 28 who do not rename psychology without qualification, mentioned applied fields of psychology, medicine, commerce, engineering, and secretarial work.

The replies to the question, "What other courses which you did not take at the University would you take if you were to start your college career again?" were not tabulated so as to distinguish between those who would and those who would not major again in psychology. Four persons made no reply to this question, including the 2 who had indicated that the choice of a major made no difference. A total of 130 replies were made by the 58 persons who answered this question. The maximum number of subjects mentioned by any individual was 9, the average being 2.3. In some instances the replies represented subjects in the fields in which the individual would major; in some they were subjects supplementary to these fields; and in other cases they were probably listed for their cultural value. The subject most favored was mathematics (statistics usually specified) with 14 mentions; commerce and physiology were tied for second place with 9 mentions each; economics, music, and philosophy were each mentioned 8 times; art, education, sociology, and zoology were each mentioned by 6 individuals; English and political science by 5. The frequencies with which all other subjects were mentioned were less than five.

That the undergraduate work in psychology done at the University of Illinois was considered helpful in many ways to these individuals is indicated by their own testimony and particularly by the fact that about two-thirds asserted that they would again major in psychology, although some with qualifications, if it were possible to begin their undergraduate careers again.

Suggestions regarding psychology curriculum. To the question, "What general or specific changes would you suggest in the psychology curriculum at the University of Illinois?" 1 person made the ambiguous reply, "a revolutionary one," and 13 made no reply or professed to be unable to make suggestions. The remaining 48 persons made a total of 88 suggestions, 1 to 4 each, the mean being 1.7.

It is difficult to catalogue all of these suggestions. One general trend is present, however, since the largest number of suggestions, totaling 36, were to the effect that the psychology curriculum be made more practical. Thirty persons would like to see the addition of more applied courses. Some of these 30 mentioned as many as 5 such courses. Along a somewhat similar vein, six persons recommended a more practical emphasis in the presentation of course materials. Eight felt that the material in some of the courses should be presented in a more stimulating and interesting manner. Six suggested that a greater attempt to made to integrate the courses within the department and with courses in other departments.

Fourteen recommendations were to the effect that student be required to take specific courses. Eight of these suggestions were that such courses as mathematics, physics, and chemistry be demanded in order to insure more adequate background for psychology, while 6 would require more experimental work within psychology itself.

The remaining 24 suggestions were more or less individual and no general comments can be made regarding them.

Interpretation of data. What significance do these responses have for teaching undergraduate psychology majors and for the undergraduate psychology curriculum? If we can assume that former undergraduate psychology majors are competent judges of what should be included in undergraduate courses in psychology, the task of an undergraduate department of psychology, even for its own majors, is primarily that of general education, and only secondarily that of specific preparation for occupational specialization in related fields and for professional training in psychology. It would seem that Wolfle's (3, p. 689) statement, "It is much more to the point to train elementary students to think for themselves about psychological problems than to teach them the logical and experimental steps in a method which most of them will never use," is almost as appropriate for all, or at least most, undergraduate courses in psychology as it is in connection with the first course itself. The frequent suggestion that undergraduate courses be made more practical and applied presumably refers to aiding students to gain greater insight into their own and other's personality and problems, as well as to training for occupational specialization in related fields. If so, Wolfle's third objective for the elementary course (**3**, p. 689), "to make the elementary course useful to the individual student by developing his ability to understand and to cope with the personal adjustment problems of daily life," is also pertinent to all, or at least most, undergraduate courses.

Since opportunities for professional work in psychology with only a bachelor's degree are reported to be negligible, and only a small portion of those who get a bachelor's degree in psychology ultimately become professional psychologists, specific training for professional work in psychology might well be delayed until graduate study. Such a procedure might enable psychologists to do more effectively, to again quote Wolfle, "the much more important job of helping to prepare the student for the role of an educated member of society" (**3**, p. 690).

Summary. The University of Illinois chapter of Psi Chi studied the post-college vocational activities and attitudes of alumni who had graduated with a bachelor's degree during the years 1932–1940 with a major in psychology. Sixty-two, or 35 per cent of 176 individuals, replied to an inventory mailed to them in the autumn of 1941.

1. Thirty-nine, or 63 per cent, of those who replied were gainfully employed; 10, or 16 per cent, were housewives; another 10 were students not gainfully employed; 3, or 5 per cent, were unemployed.

2. The salaries of those employed at the time of the inventory ranged from $700 to $3500 per year, the median being $1312.50. The tenure ranged from 1 to 84 months, the mean being 24 months.

3. Eighty-four per cent of the total group believed that their psychological training was helpful, valuable, or indispensable in their post-college vocational activities, 73 per cent describing their work as being psychological in nature to some extent.

4. Although only 8 per cent of the group were employed in strictly psychological positions, with an additional 6 per cent taking post-graduate training as preparation for professional psychology, 25 per cent of the group professed strictly psychological positions as goals.

5. Occupational opportunities for the individual with only a bachelor's degree are reported as being very limited.

6. Eighty-four per cent chose to major in psychology "because of a general interest" in the field, 71 per cent "because of a desire to understand others," 69 per cent "as an aid in their own personality problems," 63 per cent for "training in professional work in psychology," and 61 per cent as "supplementary training in other fields." In respect to one or more of the above reasons, 73 per cent rated the courses in psychology as *valuable*, 58 per cent as *indispensable*, 56 per cent as *helpful*, and 6 per cent as *useless*.

7. About two-thirds of the former majors would again choose psychology or some applied aspect of psychology if they could start their college career over again.

8. Seventy-five per cent of those who made suggestions regarding the courses in the psychology curriculum would like to see the courses made more practical.

9. The suggestion is made that specific training for professional work in psychology might well be delayed until graduate study.

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WOMEN IN AMERICAN PSYCHOLOGY: PROLEGOMENON

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Something ought, we think, to be done about women in American psychology. We ought to know the facts about what they are doing, and we ought then to consider whether they have any special role in the American scene, what their special functions are and why, what aspiration would best represent the full utilization of America's women in psychology.

In this first paper we undertake merely to discover the numerical facts. How many women are there in the American Psychological Association? How many are there in the American Association for Applied Psychology? How active are they? Do they fill administrative posts in proportion to their numbers? In general they do not. Why not? Do they not wish to, or will not the more numerous men elect or appoint them? Why do women function somewhat more effectively, as it would seem, in the American Association for Applied Psychology than in the American Psychological Association? Do women 'naturally' make better applied psychologists than 'scientific' psychologists, or is it our culture that directs them into special fields of endeavor?*

Everyone knows what has happened. American psychology in the 1880's and 1890's got its foot in the doors of American colleges and universities. In 1892 the American Psychological Association was founded for "the advancement of psychology as a science." A great deal of its subsequent history can be explained by the meaning of that word *science*. A great deal more was due to the fact that psychologists were, for the first forty years of the Association's life, mostly college and university teachers of psychology. The men's colleges wanted men teachers. The women's colleges might take women teachers, but they wanted some men too. The coeducational colleges wanted mostly men teachers, although sometimes a few women as well. The higher education of women had lagged behind the higher education of men; and there were fewer women's colleges than men's colleges, fewer women students than men. Men disliked being taught by women more than women, accustomed to being led by men, disliked being taught my men. There just was not, at the beginning of American psychology—nor is there now—as much chance for a woman to get a job as a teacher of psychology as there was for a man.

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* Gardner Murphy (2) seems to think that there are some psychological activities at which women succeed better than men, but he does not say why, merely giving examples of women who, in limited fields, happened to display leadership in 1943.

When clinical psychologists and school psychologists began to be important, women began to find more jobs open to them. Did they go into this work because few other positions were available, or because women are more 'personal,' more interested in children, than are men? That is a hard question to answer. We do not know whether we are discussing educational culture in America or the fact that men never have prolactin in their blood. Perhaps the answer does not matter. The fact is that the activities of women in American psychology have never, taken in the mass, been as noteworthy as the activities of men. Both men's and women's activities in professional associations have been increasing rapidly throughout the years, but the women are still far behind.

All this is not unrelated to the history of psychological associations in America, and to that blessed word *science*, for the advancement of which the American Psychological Association was founded. In 1937, a group of applied psychologists, frustrated by the dedication of the American Psychological Association to 'pure science,' clamoring for their place in the sun, broke away to found their own medium of self-expression, the American Association for Applied Psychology. In this clamor the voices of women were clearly discernible. There were enough female applied psychologists for them to be heard. The percentage of women in the new association was somewhat greater than in the old, and the women were more vocal, more active, more effective. Some of their frustration must have been relieved, but not all.

That the women psychologists still resented the barriers set up against them became evident when the Second World War created a national emergency. Many women believed that the men were favored in their chances to fight the Axis through service in the armed forces and in government agencies. The National Council of Women Psychologists was formed early in 1942 to give women greater opportunity to be of service on the home front. Many women wanted to be used more than they were and some are still seeking avenues for more effective war service. In part this frustration is economic: why should not women have jobs, enough jobs, good enough jobs? In part it is ideational: women feel that they can fulfill a useful function both in the emergency and in the reconstruction of the American social fabric after the war.

Whether or not these schisms in the American body psychologic will be healed by the reorganized American Psychological Association, in which each of the larger societies swallows the other, remains to be seen. It is, however, pertinent at the present time that we should have the facts about women in American psychology, because women, their needs and frustrations, have been in part responsible for these schisms.

The gross numerical facts about the numbers of women in these two associations and their administrative activities therein, this paper sets forth. We leave until another time a consideration of the basic problem of what women might do and how they might be permitted or persuaded to do it.

Table I analyzes the membership of the American Psychological Association, in respect of both Members and Associates, by sex. The Association, as a matter of fact, does not know the sex of its members.

TABLE I

MEMBERSHIP IN THE AMERICAN PSYCHOLOGICAL ASSOCIATION ACCORDING TO SEX AND CLASS OF MEMBERSHIP

Year	Members			Associates			Total		
	Men	Women	Total	Men	Women	Total	Men	Women	Total
					Numbers				
1943	624	136	760	1835	880	2715	2459	1016	3475
1938	483	112	595	1157	566	1723	1640	678	2318
1933	420	110	530	751	388	1139	1171	498	1669
1928	421	112	533	38	128	166	459	240	699
1923	376	81	457	—	—	—	376	81	457
					Per Cent				
1943	82	18	100	68	32	100	71	29	100
1938	81	19	100	67	33	100	71	29	100
1933	79	21	100	66	34	100	70	30	100
1928	79	21	100	23	77	100	66	34	100
1923	82	18	100	—	—	—	82	18	100

It has taken us some research to find out in certain cases, and we may indeed have made some errors. There are, however, not many errors. We have succeeded in checking the figures of the Yearbooks in their grand totals, but not exactly in the numbers of Members and Associates, although there, too, the discrepancies are too small to matter. We have plotted the growth of the Association in respect of classes of membership and sex for the last two decades by quinquennia. The trends are stable and further analysis has seemed to us unnecessary. The growth curves, plotted from Table I, are shown in Figs. 1–6.*

The table and the figures show that the relative numbers of Members in the Association has remained about constant, near 20 per cent. When the grade of Associate was established in 1926, more women became Associates than men, but presently (by 1933) the percentage of women settled down at a little more than 30. The female percentage of the total membership has since 1930 been about 30.

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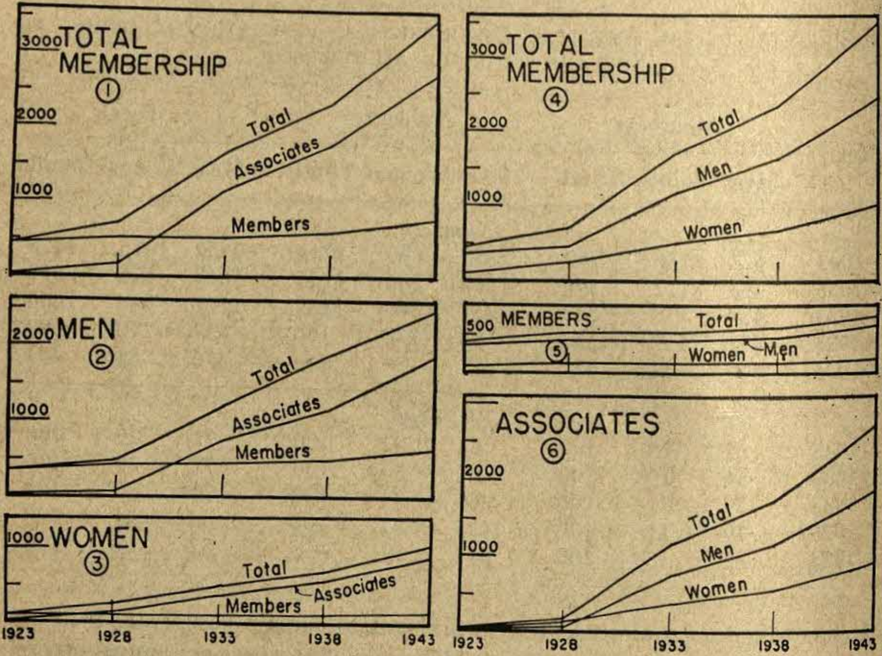
* For other growth curves of the American Psychological Association—the growth of its membership and of its interests in different kinds of psychology—see S. W. Fernberger (1).

The American Association for Applied Psychology has a shorter history. The corresponding data for this organization are given in Table II—three samplings for the quinquennium 1938–1943. About 30 per cent of its Fellows are women, a figure which may be compared with the 20 per cent of the Members of the American Psychological Association.



Figs. 1–6. Growth of Memebership in the American Psychological Association according to Sex

Women are somewhat more numerous among the more accomplished applied psychologists than among the more accomplished 'scientific' psychologists. Among the Associates of the two associations the difference is about the same. One-third of the Associates of the American Psychological Association are women, as compared with two-fifths of the Associates of the American Association for Applied Psychology.

Thus, in 1943, there were 1016 women (29 per cent) of a total membership of 3475 in the older association, and 218 women (33 per cent) of a total membership of 661 in the younger association. The more active role of women in the newer association is, therefore, not due entirely to their numbers, although it should be noted that the percentage

TABLE II

MEMBERSHIP IN THE AMERICAN ASSOCIATION FOR APPLIED PSYCHOLOGY ACCORDING TO SEX AND CLASS OF MEMBERSHIP

Year	Fellows			Associates			Total		
	Men	Women	Total	Men	Women	Total	Men	Women	Total
				Numbers					
1943	298	132	430	144	87	231	442	219	661
1941	270	125	395	130	84	214	400	209	609
1938	188	100	288	65	58	123	253	158	411
				Per Cent					
1943	69	31	100	62	38	100	67	33	100
1941	68	32	100	61	39	100	66	34	100
1938	65	35	100	53	47	100	62	38	100

of women at the founding of the American Association for Applied Psychology was 38. It dropped off a little in later years.

The most obvious way of assessing the activity of women in these two associations is to count the number of administrative appointments they have held as officers, editors, committee members and representatives of the association in other organizations. These data are given for the American Psychological Association in Table III, for the American Association for Applied Psychology in Table IV. Since there seems to

TABLE III

ADMINISTRATIVE APPOINTMENTS IN THE AMERICAN PSYCHOLOGICAL ASSOCIATION ACCORDING TO SEX

Year	Officers			Editorial Appointment			Committee Members			Representatives			Totals			
	Tot.	Men	Women	Tot.	Men	Women	Tot.	Men	Women	Tot.	Men	Women	Tot.	Men	Women	% Women
1943	9	8	1	9	9	0	86	75	11	30	28	2	134	120	14	10
1942	9	8	1	8	8	0	85	76	9	28	25	3	130	117	13	10
1941	9	9	0	8	8	0	80	71	9	28	25	3	125	112	13	10
1940	9	8	1	8	8	0	67	66	1	29	26	3	113	108	5	4
1939	11	1	0	8	8	0	55	54	1	30	28	2	104	101	3	3
1938	9	9	0	8	8	0	33	33	0	30	29	1	80	79	1	1
1933	9	9	0	8	8	0	16	16	0	16	16	0	49	49	0	0
1928	9	9	0	—	—	—	13	13	0	13	13	0	35	35	0	0
1923	9	8	1	—	—	—	35	30	5	10	10	0	54	48	6	11

have been a sudden increase in the number of such appointments in the older association about 1941, the data in Table III are given by successive years in the quinquennium 1938–1943.

It is at once apparent that women have been more active in the younger association than in the older. In the American Psychological association there have been few women officers, no women editors, and only recently any appreciable number of women committee members. The percentages run in the years studied from zero to 4 (an exception in 1923) until 1940. In the last three years, 10 per cent of the appointments have been of women. The corresponding percentages for the American Association of Applied Psychology are 18, 19 and 25 in the three years sampled.

TABLE IV

Administrative Appointments in American Association for Applied Psychology according to Sex

Appointments	1938			1941			1943		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
Officers—General	13	11	2	15	12	3	15	9	6
Officers—Sections									
Clinical	10	9	1	10	7	3	11	7	4
Consulting	9	7	2	9	5	4	9	3	6
Educational	6	5	1	10	10	0	7	7	0
Industrial	6	5	1	10	8	2	10	9	1
Editorial Appointments	19	16	3	20	15	5	22	12	10
Committee Members	113	92	21	78	66	12	107	90	17
Representatives	—	—	—	3	3	0	6	4	2
Totals	176	145	31	155	126	29	187	141	46
Percentages	100%	82%	18%	100%	81%	19%	100%	75%	25%

Do women get their share of the jobs? Are their services utilized in proportion to their numerical availability? In the American Psychological Association, No. In 1943, only 10 per cent of the official appointees were women, whereas 18 per cent of the Members were women and 29 per cent of Members and Associates considered together were women. In the American Association for Applied Psychology the answer to the question is still No, but the women are much more generously represented, or more onerously used, whichever phrase is right. In 1943, 25 per cent of its appointees were women, 31 per cent of its Fellows were women, 33 per cent of its total membership were women.

In the American Psychological Association, there have been 29 presidents, of whom two were women (Calkins, Washburn). In the American Association for Applied Psychology, there have been seven presidents, all men. Among the 21 chairmen of sections elected by this latter association, only one has been a woman. The people who do the hard work—the secretaries of the section—are apt to be women: 8 of 13.

One of the reasons why women play a less important role in the American Psychological Association than in the American Association for Applied Psychology is that the older association is devoted to 'scientific' psychology, and fewer women become distinguished 'scientists' than do men. The word *science* in these contexts has its meaning set by the older sciences—physics and chemistry primarily, the biological sciences secondarily. As to whether the exclusion of women from wide participation in the established sciences is due to nature or nurture, we venture no opinion, but certain it is that modern civilization tends not to place them in 'science,' not in any large numbers. Here are some of the facts.

In the fifth edition of *American Men of Science* (1933), of 9785 names listed, only 745 (7.4 per cent) were the names of women. These names can be allocated to twelve sciences, and the percentages of women run from 2.1 per cent for physics up to 10.4 per cent for physiology—except for psychology, a 'science' in which there were listed 117 women (22.0 per cent) of a total of 539. Probably psychology has introduced more professional persons into 'science' than most of the other 'sciences,' and in its case the professional jobs were the kind that women get and take—the jobs that have to do with the welfare of other persons.

What about high distinction? In each edition, *American Men of Science* stars the names of the supposedly most distinguished persons in each science. In its seven editions (1903 to 1943), the names of 127 psychologists have been so starred. Only eight of these names (Calkins, Ladd-Franklin, Washburn, Howes, Martin, Wooley, Downey and Goodenough) are women. That is 6.3 per cent. Of course, this is a closed society. Stars elect stars. That may be a factor in the result, but the result nevertheless tends to establish the pattern. Women ordinarily are not thought of as good scientists—not, at any rate, by most men scientists.

The highest scientific election that a person can receive in America is considered by some to be election to the National Academy of Sciences. It has had, since its foundation in 1863, 769 members. Among these, there have been only two women: Florence R. Sabin in pathology in 1925, and Margaret F. Washburn (a psychologist!) in 1931. That paucity of women must mean something more in our culture than the fact that men tend to vote for men.

In this connection it might be said that many of the committees of the American Psychological Association seem to have functions that would ordinarily be thought of as male. A Committee on Publicity and Public Relations might have women on it, might have a woman chairman, but is not the articulate public mostly male and could not a man thus make the best contact with it? Would a Committee on Public Investments be likely to be female with the social structure what it is? Of course, a Committee on War Services to Children might be, and is, female. Women know about children, or are supposed to. All in all, it is our impression that the Association has more committees concerned with activities that are traditionally considered male than it has for the traditionally female interests.

There remains, nevertheless, the fact that even the American Association for Applied Psychology has fewer women in positions of responsibility than the feminine proportion of the membership would seem to make probable. Why? It is not devoted primarily to 'science,' supposedly a male field. The discrepancy must lie in the culture. Men vote for men and women vote for men, not always, but often enough to upset the proportions. Men are in the majority and determine the outcome of many votes. They hold the controlling interest. Women look to men for leadership more readily than men look to women. That asymmetry is deeply imbedded in our culture. And all these influences are cumulative. If women do not get elected to responsible posts as often as men, then there are fewer women of influence around the council table to help correct the discrepancy, and there is also less incentive for career-minded women to enter the field and to attempt in it to satisfy their ambitions.

If some superhuman decree, issued by an experimentalist-dictator, could arbitrarily reverse the number of men and women in important scientific positions without altering human nature, would that new imbalance, once established, tend to perpetuate itself? Or would some natural law of sex-difference presently assert itself and bring the proportions back to what they are now? We hope to have something to say about this matter in a later paper.

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A NOTE ON PSYCHOLOGICAL JOURNALS FOR FOREIGN LIBRARIES

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The American Library Association, through its Committee on Aid to Libraries in War Areas, in the current year is purchasing 150 volumes of American Psychological Association journals to be set aside for foreign libraries forced to relinquish subscriptions because of the war. The purchases are part of a program started in 1940 which now involves large numbers of subscriptions to 312 different scholarly, scientific and technical periodicals, of which APA journals number six and all psychological publications 20. Medical journals constitute about 25 per cent of all purchased.

Purchases by the ALA have to a considerable extent offset wholesale cancellations which left the Association with only a handful of foreign subscriptions in 1941. Following are Association journals on the ALA foreign reserve list to be stored until after the war:

	1944	*1943*	*1942*	*1941*	*1940*
Abstracts	25	25	25	20	20
Bulletin	15	15	15	5	—
Review	50	50	50	35	20
Experimental	20	20	20	5	—
Abnormal and Social	20	20	20	5	—
Applied	20	20	*	*	*

* Small reserves of this Journal for these years are held by Dr. Porter for later delivery.

Despite the volume of journals being sought, the ALA estimates it is meeting only half the foreign need and urgently solicits gifts from both individuals and publishers of current and back volumes—current volumes to supplement the committee's program, and back volumes to restore periodicals destroyed during the war, which the committee, under terms of the grant, is not able to replace. A number of gifts have been received and some allied governments and nationals are beginning to finance purchases for their own libraries, which the committee considers good signs. During 1943, for example, two groups of orders were placed for Chinese libraries, one being paid for by a Chinese government service and the other by the China Foundation.

The APA, apart from the ALA, in 1943 received an order from the Chinese Minister of Education, through the Universal Trading Corporation, for 20 sets of all seven of the journals for the years 1940–1946, inclusive. The Corporation assumes all storage and shipping responsibilities. In addition, a few journals go to the Associated Boards of Christian Colleges in China to be stored until after the war.

The Committee on Aid to Libraries in the War Areas has operated on an annual budget of about $70,000 since 1941, with funds supplied by the Rockefeller Foundation. Periodicals purchased totaled $43,000 in 1941; $52,845 in 1942; and $65,029 in 1943. However, in no case have funds allowed purchase of more than 50 per cent of the number of foreign cancellations reported by publishers. In view of the Committee's limited finances, publishers have allowed discounts on their publications averaging 17.4 per cent in 1943 and 15 per cent in 1942. In both years, the APA's discount was above the average, ranging from 25 per cent for the *Journal of Applied* to almost 50 per cent for the *Review*.

The Committee, originally called the Committee on Devastated Libraries, was organized toward the end of 1940, with the broad purpose of offering aid to libraries in war-torn countries. Its name was changed to indicate aid would not be limited to libraries suffering physical devastation. Inquiries about contributions to the very worth-while work of the committee should be directed to DOROTHY J. COMINS, Committee on Aid to Libraries in War Areas, Library of Congress Annex, Study 251, Washington 25, D. C.

PSYCHOLOGY AND THE WAR

Edited by
DONALD G. MARQUIS

CONTENTS

HISTORY, ORGANIZATION, AND RESEARCH ACTIVITIES, PSYCHOLOGICAL TEST FILM UNIT, ARMY AIR FORCES, by *Staff, Psychological Test Film Unit*.......... 457

THE MOBILIZATION OF PSYCHOLOGISTS FOR WAR SERVICE, by *Donald G. Marquis*.......... 469

PERSONNEL PSYCHOLOGISTS AT STANFORD UNIVERSITY, by *Edward K. Strong, Jr*.......... 474

HISTORY, ORGANIZATION, AND RESEARCH ACTIVITIES PSYCHOLOGICAL TEST FILM UNIT ARMY AIR FORCES

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This article is the sixth in a series describing the Aviation Psychology Program of the Army Air Forces. Previous articles have dealt with a general description of the program and with the activities of Psychological Research Units No. 1, 2, 3, and the Department of Psychology, School of Aviation Medicine, and with the development and use of the Aviation Cadet Qualifying Examination (**1**, **2**, **3**, **4**, **5**).

The following sections describe the history, organization, personnel, functions, and research activities of the Psychological Test Film Unit.

I. HISTORY, FUNCTIONS AND PERSONNEL

The Perceptual Research Unit was originally set up in early July, 1942, as one of the three units of the Psychological Section, Office of the Surgeon, at the Headquarters of the Flying Training Command in Fort Worth, Texas. Its primary purpose was the constructing of aptitude tests for aircrew in the general field of perception, together with the carrying out of research in this field.

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* This article was prepared by the Staff of the Psychological Test Film Unit and edited in the Psychological Branch, Research Division, Office of the Air Surgeon, Headquarters Army Air Forces, Washington, D. C.

For a period of over a year, the personnel of the group consisted of Captain (now Major) J. J. Gibson, Chief of Unit, Lt. (now captain) R. H. Henneman, Lt. (now Major) S. R. Wallace, and Lt. (now Captain) G. F. J. Lehner. All of these officers were psychologists with experience in experimental research, although none had been professionally engaged in test-construction. The administration of experimental tests to Aviation Cadets was accomplished by utilizing the testing facilities of the three Psychological Research Units in the Classification Centers. In general, the work of test construction was concentrated on two kinds of tests, printed group-tests and motion picture group-tests.

In order to continue the work on motion picture tests and the research on new testing techniques and other allied problems involved in the psychological use of films, the Psychological Test Film Unit was activated in October 1943 at Santa Ana Army Air Base, Santa Ana, California, and assumed the functions of the Perceptual Research Unit. The work of test administration was coordinated with that of Psychological Research Unit No. 3, and for the technical aspects of film production the cooperation of the AAF First Motion Picture Unit, a producing studio, was obtained. Continuation of the research on the paper and pencil type of perceptual group tests was turned over to the staff of Psychological Research Unit No. 3. The functions of the new unit were designated as:

a. the construction of motion picture tests for classification purposes;

b. research on motion picture and photographic methods of psychological testing and on problems of administering and scoring motion picture tests;

c. research on training problems connected with or amenable to motion picture and photographic techniques; and

d. advising, editing, and cooperating in the production of films for tests developed in any of the units of the Aviation Psychology Program.

The officer personnel consisted of Major J. J. Gibson, director, Captain G. F. J. Lehner, 1st Lt. R. M. Gagne, and 1st Lt. R. M. Eisenberg. The enlisted personnel, as of 1 April, 1944, were T/Sgt. R. W. Bornemeier, S/Sgt. E. C. Wiegand, S/Sgt. H. B. Price, S/Sgt. B. C. Finney, Sgt. N. N. Glaser, Cpl. C. H. Orvis, Pfc. E. M. Bannerman.

II. Hypotheses Adopted for Perceptual Test Development

A number of guiding hypotheses have been adopted, either explicitly or implicitly, for the work of aptitude test construction. In the most general terms it was believed that flying involved the use of visual cues to a large extent and that, consequently, tests of perceptual skills were very important for measuring aptitude for aircrew duties. This assumption applied particularly to pilots and accordingly the plans for test development at the beginning gave first place to pilot tests. At the start of the perceptual research program, the data for planning and guiding test development were secured from the following sources:

1. The examination and interpretation of results of perceptual tests already validated against the criterion of graduation or elimination from pilot training.
2. The evidence from job analyses of the duties of aircrew members. This evidence was supplemented by the application of principles from the experimental psychology of visual perception whenever possible and by information from other activities.
3. The study of 1,000 eliminated pilots (6) made by the Psychological Division, Office of the Air Surgeon in Washington. The traits or abilities listed in this study under the heading of "Alertness and Observation" were of considerable value. Such traits as "Visualization of Flight Course," "Estimation of Speed and Distance," and "Orientation" were capable of interpretation in terms of actual psychological judgments or discriminations. Other traits appeared to be psychologically more complex.
4. The use of the inconclusive evidence available on pilot aptitude testing from the first World War and the subsequent interval of peace.

The more specific hypotheses employed for selecting certain tests to be developed rather than others were as follows:

1. The validities being obtained in the summer of 1942 on certain perceptual tests requiring judgments of distance and length suggested that similar tests also involving estimation of distance in two dimensions would be promising. As a result of this hypothesis, the Map Distance Test and the Path Length Test were constructed, using a map background for the purpose of giving the tests a plausible aircrew content. The Judgment of Proportions Test was constructed on a similar hypothesis, namely, that accuracy of visual imagery of familiar sizes and distances might correlate with flying aptitude. The validity of the Speed of Identification Test and of Part I of the Spatial Orientation Test also suggested that a test for speed of visual pattern-perception would be valuable, particularly if the perceptual speed factor were given a special emphasis by using individual brief exposures of the items. The Plane Formation Test was therefore devised, employing motion picture film for the controlled presentation of the visual patterns.
2. It was assumed at the beginning that tests requiring discriminations of time and events-in-sequence were necessary to supplement the motionless type of visual discriminations required by paper and pencil tests already in use. Plans were made, therefore, for the development of film tests which make possible a wide range of judgments involving motion, and hence are closer to the realities of aircrew performance. In particular, the Speed Estimation Tests were planned involving three different types of movement-perception.
3. It was assumed that, since tridimensional vision was obviously of importance for flying, tests requiring space perception and "constancy" of perception would be of value for the program. As a result, a memorandum on "The Application of the Concept of Perceptual Constancy to Aviation" was written and a research program was initiated on tridimensional vision. A number of tests arising out of this program have been planned and constructed, including a motion picture test of ability to make certain spatial discriminations believed important for landing.

4. It was believed that some aspects of "alertness" or "attention" ought to be tested, although this general hypothesis was difficult to translate into a specific test at the beginning. The standard laboratory experiments under the conventional heading of attention were appraised, but they appeared wholly inadequate to provide a test of the sort required. A motion picture test consisting of the presentation on the screen of moving dials on a schematic instrument-panel was early agreed upon, but the outline for this test underwent several stages of development before experimental forms were constructed. The chief difficulty encountered was in inventing some method of employing the fixed-category answer sheet (necessary for group testing purposes) for recording reactions to the dials. The Flexibility of Attention Test and the Integration of Attention Test were the result of these efforts.

5. The hypothesis was adopted that the ability to visualize images and spatial relationships was an important factor in aircrew success. For this reason, tests constructed by Professor L. L. Thurstone, including those weighted with what he called the "Space Factor," were looked upon as promising. Adaptations of these tests were constructed and additional tests such as the Picture Integration Test were devised on the basis of this hypothesis for inclusion in a battery of perceptual tests to be factor analyzed.

6. It was assumed that the complex ability to maintain visual orientation in space was important for aviation aptitude. A paper and pencil test of one aspect of directional orientation to the points of the compass was constructed, and a motion picture test of the ability to maintain orientation in a moving visual environment presented on the screen is under construction.

7. The hypothesis, taken from the study of 1,000 eliminees (6), of a complex trait called "Visualization of Flight Course" was agreed upon as one important to be tested. The trait was assumed to involve at least the third, fifth, and sixth functions listed above, plus the ability to integrate temporal impressions. The latter trait was suggested as important by Dr. V. Lowenfeld, and his test proposal was borrowed, with some modifications, for development. Two motion picture tests of the ability to combine successive impressions into a single perception have resulted.

III. TECHNIQUES EMPLOYED IN TEST CONSTRUCTION

The techniques which have been employed in developing perceptual aptitude tests can be classified in three ways: first, by test media; second, by types of judgment; third, by statistical procedures. They will be taken up in that order.

A. *Test Media*

1. *Paper and Pencil Group Test Method.* The standard procedures for constructing paper and pencil tests were utilized. The desirability of constructing all tests in such a way as to be scorable by machine resulted in experimentation on the effects of the procedure.

2. *Motion Picture Group Test Method.* The use of motion pictures for the presentation of group tests carried with it certain difficulties as compared with ordinary group tests, such as the necessity for equalizing

the visibility of the test items among the different testees, and the obtaining of a proper level of illumination of the testing room for writing responses; but it also had definite advantages over ordinary methods of testing, such as perfect standardization of directions by the sound track and, above all, the provision of a wider range of functions capable of being tested. Motion picture tests have now been administered on many occasions to larger samples under varying circumstances, and administrative problems have proved to be soluble. The method is believed to be not only practicable, but also to open up a new field for psychological testing.

3. *Individual Test Methods.* The most familiar procedure for either perceptual experiments or tests is the use of individual apparatus setups, such as the exposure device or, when the motor reactions are emphasized, the reaction or pursuit apparatus. It was considered at the outset that this method might also be employed for perceptual test research, but as the program developed emphasis was placed on methods (1) and (2) and consequently on the development of group tests for measuring perceptual functions. The virtue of this necessity was that group tests are highly economical of testing hours required for administration.

B. *Methods of Using Fixed-Category Answer Sheets*

Although the restriction to the use of printed answer sheets capable of being machine scored and providing only fixed answer categories appeared at first to limit seriously the possibilities for recording different types of perceptual judgments and discriminations, it was found that the restrictions could frequently be overcome. Several examples of the techniques employed may be given:

1. *Adaptation of the Method of Direct Reproduction to Answer Sheets.* Believing that the ability to imagine and reproduce visual patterns is not the same as the ability to recognize them, it was thought desirable to require the former type of response in a perceptual speed test, the Plane Formation Test. Each test item consisted of a visual pattern of five planes in a 25 space matrix with brief exposure intervals. This demanded a special use of the answer sheets. The demand was met by printing lines on the answer sheets to form blocks containing 25 answer spaces each. It was then demonstrated that the scores obtained from the scoring machine when each response was counted either right or wrong correlated well with the results from scoring the patterns as a whole. In a somewhat similar way, in the case of the Picture Integration Test, the response of making a spatial rearrangement of the disarranged segments of a picture was, after sone exploration, set up for scoring on an answer sheet.

2. *Adaptations of Various Perceptual Judgments to Fixed-Category Answer Sheets.* Most of the types of perceptual judgments which it was desired to use could not be fitted into either the conventional 5-choice or true-false categories. It was also thought to be undesirable to use answer sheets with more than five categories in any time limit test, since this alternative would emphasize the factor of clerical rather than perceptual speed. A number of methods were adopted for reducing various perceptual responses to simple categories. For example, the Directional Orientation Test, which involved at the beginning eight reactions corresponding to the eight points of the compass, was later simplified so as to involve only "matching" reactions between two compass diagrams. The Pattern Analysis Test and later the Flexibility of Attention Test were set up in such a way as to be recorded by a simple identifying reaction which consisted of either marking or not marking a single pair of the dotted lines on the answer sheet. In another test, Speed Estimation Test III, a judgment of relative visual velocities was required in terms of the prediction of the one of five positions in space at which an event will occur. This scale corresponded to the five categories on the answer sheet.

3. *Use of an Intermediate Work Sheet.* In the case of several tests where the response was not fitted for immediate recording on answer sheets, or where the variance produced by differences in clerical accuracy and speed had to be minimized, the use of an intermediate work sheet was employed for the primary responses to the test. These records were then transcribed on answer sheets by the testees. This method has proved to be practical for the Picture Integration Test, the Flexibility of Attention Test, and for research on the motion picture achievement test in Aircraft Recognition. The additional time required for administration is negligible as compared with the advantages gained.

C. *Employment of Item Analysis*

It was assumed that perceptual and motion picture tests should be constructed experimentally in a form containing many more items or judgments than were expected to be used in the final version of the test. An item analysis was then carried out, and the items were selected for consistency, proper level of difficulty, and in some cases for item validity.

IV. TEST CONSTRUCTION

A. Instead of a listing of all the perceptual tests constructed, some of which have already been referred to in Sections II and III, a description will be given of one representative motion picture test, together with a brief account of the methods used to produce it.

One of the first test films planned was Speed Estimation Test III, Estimation of Relative Velocities, one of three tests requiring complex judgments of speed and motion. The intention was to construct a motion picture test requiring a complex judgment of the relations between two velocities, measured by estimating the imagined point at which the faster of two moving spots (planes) would overtake the slower. The paths of the two motions were parallel so that the judgment could not be reduced to a merely geometrical one.

Two animated planes are seen on the screen against a skyline background, one overtaking the other. Before the overtaking point is reached, both planes disappear behind a cloud and a five point scale appears superimposed on the cloud. The testee must project the two velocities and judge at which of the five points the two planes would coincide. The test consists of 50 trials, 10 at each of the five points, in a random order.

The original shots for this test were photographed by the animated cartoon department of a large commercial studio, under contract, on 35 mm. film. Detailed specifications for the frame-by-frame photography were worked out and the necessary shots were produced under the supervision of an Aviation Psychologist. Further work on the test was then carried out in the AAF film laboratory at Wright Field. The film was reduced to 16 mm., suitable for use with standard AAF motion picture sound projectors which were available at all stations. The individual items were printed and edited; the introductory directions to accompany the practice items were written and recorded on the sound track, and the items were separated by six seconds of blank film to permit recording of answers on a standard five choice answer sheet. The beginning of each successive presentation was announced by a subtitle and voice speaking the item number. A limited number of prints of this film was made for tryout. The test was then revised and re-edited with respect to time intervals, length of items, and details of photographic processing. Final prints were made and distributed. This test has been administered at all psychological testing units for the purpose of studying problems of motion picture test administration, but has not been included in the battery of classification tests. It might be noted that this test appears to measure a relatively unique perceptual function since its correlations with other tests are very low, and it is not loaded with any of the factors discovered by factor analysis of other tests in the program. The same characteristics apply to the other motion picture tests requiring judgments of visual movement and velocity.

In all, eleven aptitude tests of the motion picture type have been constructed in either a final or experimental form. Three, including the one described, are tests requiring estimation of visual velocities of various types. One requires reproduction, on a standard answer sheet, of briefly exposed visual patterns and is intended as a test for speed of perception. Two, entitled "Flexibility of Attention" and "Integration of Attention" respectively, are efforts to measure the ability to take account of different events occurring in the perceptual field at the same time without becoming confused. Two more tests have to do with the complex ability to form unitary perceptual experiences from a series of successive partial impressions. Two require discriminations of, respectively, just noticeable movement and just noticeable direction of movement (drift), in the field of a bombsight schematically presented on the screen. One is a test of perceptual judgment of a sort which is required in aircraft landings, consisting of shots of a runway photographed at varying moments during an approach glide, with the requirement that the trainee estimate at which of five lettered points the present angle of glide intersects the runway. The principal sensory cue here, the differential pattern of movement in the optical field, is one which has not been adequately described in the experimental literature of three-dimensional vision.

V. Other Research

The research activities of the Test Film Unit and the Perceptual Research Unit will be summarized by listing a number of results and implications which are of primarily psychological interest.

A. *Color Vision.* Determinations of color vision are made routinely in the course of the physical examination for flying. In order to improve procedures, research projects on various aspects of color vision have been undertaken by the School of Aviation Medicine and by other offices under the Air Surgeon. The Perceptual Research Unit has participated in some of these studies. A job analysis of the role of color vision in the performance of various aircrew and combat crew duties was carried out. The study, performed in collaboration with a representative of the School of Aviation Medicine and of the National Research Council, employed three basic methods.

1. Interviews with flight surgeons and with aircrew personnel engaged in the training program or recently returned from combat were accomplished upon the assumption that these personnel could provide much useful information about the nature of the aircrew tasks which could be employed in constructing hypotheses concerning the color discriminations demanded. At the same time, other sources of information such as technical manuals, intelligence reports, and specifications of the color characteristics and uses of various signalling devices were examined.

2. Attempts were made to specify many of the discriminations demanded of the pilot and bombardier by flying over terrain at various altitudes and determining color specifications with the Munsell color books. Outside of finding that, under the conditions of this study, there is little loss in the chroma of the terrain viewed from high altitudes, this approach has not proved fruitful.

3. Experimental studies of the performance of individuals with varying degrees of color defect in flying situations involving hue discriminations have been performed. A definite relation between performance on color vision tests and ability to read flares and biscuit gun signals was discovered. Another study was made of the ability to detect camouflage in a sample of individuals tested with a relatively elaborate battery of color vision tests. A group of individuals who evidenced varying degrees of color defect was matched with respect to flying experience, age, rank in army, etc., to a group of normals. Both groups were flown at varying altitudes over camouflage panels which were placed on three different types of terrain backgrounds. A method for obtaining a quantitative measure of the accuracy of camouflage detection was devised. It was found that the normal group exceeded the performance of the color-defective group by a statistically significant amount although no relation between degree of defect within the color-defective group and accuracy of report could be discerned. The difference between the normal and color defective groups, although statistically significant, was so small as to be of little practical importance. Further analysis of the data revealed that the factor most closely related to visibility of a camouflage panel was the relation between the value (reflectivity, brightness, or texture) of the panel and of the background. Even at low altitudes, panels whose hue differed widely from that of the background were frequently overlooked if their values matched the background. Conversely, matches in hue were ineffective in preventing detection unless value matches were closely approximated.

Another study was made of a number of individuals with defective color vision who were in aerial gunnery training. The performance of these individuals during training was compared to that of the normal group. No differences could be discovered. On the basis of this study and of other information obtained by interview and observation, the color vision standards for gunnery training were modified. A follow-up study of those admitted under the modified requirements is now under way. The findings of the first study with respect to training has already been substantiated. It is hoped that information concerning the performance of these individuals in combat will also be obtained.

At the request of the Air Surgeon, a member of this Unit, in collaboration with a representative of the School of Aviation Medicine, made an evaluative survey of the color vision testing program of the Army Air Forces. Recommendations were made concerning the tests now employed, improvements in the method of their administration, desirable qualifying standards for various aircrew and combat crew positions, and plans for future research in color vision.

B. *Implications of Perceptual Testing for Individual Differences.* A considerable number of tests of a variety of perceptual functions have by now been administered to aviation trainees. It is a fact of some significance for psychological theory that, without exception, the tests show the existence of wide individual differences in the perceptual abilities measured, even with the homogeneous population available. Even such theoretically simple and relatively "sensory" capacities as form discrimination, color discrimination, judgment of visual extent, or absolute threshold for perception of movement appear to vary in the population in the same way as do motor and intellectual skills. The conception of perceptual capacities or aptitudes, and along with it the notion of perceptual learning or skill, are evidently necessary for theoretical psychology.

C. *The Perceptual Equivalence of Projected Images Viewed at Different Distances and Angles.* It might be supposed by the psychologist accustomed to work in a laboratory that a group of testees cannot all be presented with visual stimuli on a projection screen in such a way as to equalize the opportunities for effective vision among all of them. The optical stimulation from the screen is different when the screen is viewed from different distances and at different inclinations from the straight-front direction. Repeated studies of the effect of seating distance and angle-of-view on the visual performances measured by motion picture tests have been made. They demonstrate that there is a surprisingly large range of perceptually equivalent seating positions in the ordinary projection room or theater. The perceived size and shape of screen images remain approximately constant despite variations in the retinal stimuli corresponding to different seating positions. There are, of course, limits to this perceptual equivalence. Depending on the type of visual judgments required by the test, scores do begin to fall off at extreme deviations from the straight-front direction and at extremely unfavorable ratios of screen size to seating distance. "Tolerances" for seating angle and seating distances in relation to the screen may be specified.

D. *The Motion Picture as a Stimulus-Response Situation.* The motion picture situation, whether it be for teaching or for entertainment, has always involved a more or less passive attitude on the part of the audience rather than an active attitude conducive to learning. The successful administration of aptitude and achievement tests by motion pictures, with instructions given in the film for the recording of answers, and pauses provided after each item for doing so, suggests that the same method could be extended with advantage to educational films for purposes of answering test questions, making objective responses, or taking notes. In particular, "recitation" and "prompting" methods are well adapted to presentation on film. It is not difficult to set up such active situations in a projection room. The film script, however, should be written by a teacher rather than by a commercial film writer. It is only necessary to provide a dim artificial illumination of about two-tenths of a foot candle in the room to permit the use of pencil and paper. This degree of illumination does not detract from the clarity of the screen image enough to be significant.

E. *The Photographic Representation of the Depth Dimension of a Visual Scene.* In the effort to devise group tests of the ability to judge position and distance in the three-dimensional space of the flyer, a considerable amount of research has been done on how to represent photographically three dimensional space. Theoretically, all the sensory cues for space perception can be represented in photographs (still and motion picture), excepting only the binocular cues. This representation is subject to artificialities introduced into the situation by the visible flatness of the screen or photograph and the visible margins surrounding it. Efforts are being made to control and represent systematically the important monocular sensory cues in still and motion picture photographs. For purposes of aviation, many of these cues have not been adequately described in the literature. It appears that a photographic test for tridimensional space perception is possible.

F. *Research on Aircraft Recognition Training.* The training of Air Corps personnel in the identification of friendly and enemy aircraft is both universal and continuous in the training program. This type of training has no academic parallel, and hence educational research on this type of learning was lacking when training was instituted. In order to evaluate certain training methods a program of research has been carried out by this unit, largely in the aircraft recognition classes at the Santa Ana Pre-flight School.

Training in the identification of aircraft in flight seems to be primarily a matter of perceptual learning. It involves concept formation from a large number of relatively meaningless visual forms which, being mutually similar, are not at the outset distinctive. The training material is primarily photographic views of the aircraft to be learned, in the form of slides and motion pictures supplemented by silhouettes and shadow-views of airplane models. The basic method is the repeated exposure of these views. The uniform content of such courses, and the simplicity of the learning situation involved make them almost ideal laboratories for the study of perceptual learning and methods of promoting such learning.

One of the main facts emerging from such a study is the evident importance of the principle of immediate reinforcement for perceptual acts as well as for verbal and motor acts. Although some perceptual learning takes place without intention, and without immediate conformation or correction of the identification response, learning is much more efficient when every view is identified actively and then corrected or confirmed immediately.

Another conclusion regarding visual recognition is that learning is dependent on the frequency with which the views are exposed, i.e., the frequency of the acts of perception, but not at all on the duration of the individual exposures. The evidence indicates that the efficiency of learning produced by, say, 1,000 presentations is the same whether the views are exposed for only 1/50 sec. or for several seconds apiece. This conclusion is of particular interest because of the assumption, which has been made, that instantaneous exposures promoted instantaneous recognition.

G. *Achievement Tests in Aircraft Recognition.* Experiments on the effectiveness of different techniques of recognition training have necessitated the development of tests for the measurement of proficiency in aircraft recognition. The motion picture medium is particularly well adapted to this type of testing, since it makes possible the presentation of realistic views of airplanes under natural and varied conditions of movement, position, lighting, and background. The development of these test films suggests many possibilities of the usefulness of motion picture achievement testing, particularly in those fields in which motion and tridimensionality constitute essential aspects of the subject matter.

The Psychological Test Film Unit expects to continue a number of the research projects described or referred to, with added emphasis on training problems.

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THE MOBILIZATION OF PSYCHOLOGISTS FOR WAR SERVICE

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The allocation of psychologists for service in the war effort has involved problems and procedures which are significantly different from the pattern in other professions. Certain fields, such as medicine and engineering, were immediately recognized as critical occupations, and an official mechanism was provided to guarantee an adequate supply for essential civilian activities and for military service. The War Manpower Commission, through the National Roster of Scientific and Specialized Personnel, directed by Dr. Leonard Carmichael, was asked to advise with Selective Service in determining occupational deferment in these professions. On the other hand, fields such as law and social work were not considered critical occupations and their members were inducted through regular channels. Psychology seems to fall somewhere between these two groups. There is a continuing demand for psychologists in both military and essential civilian service—a demand which could not be adequately met with the existing supply of trained personnel. During the first year of the war psychology was listed as a critical occupation by Selective Service, but this listing was dropped in 1943 when the military needs appeared greater than the civilian.

Although there has been no official control of the mobilization of psychologists, this does not mean that there has been no planning or direction of any sort. It is clear from the extensive correspondence in the Office of Psychological Personnel that individual psychologists have sincerely faced the question of where they could be of most service and have acted accordingly. Universities and other employers have surveyed their needs carefully, releasing certain employees for service elsewhere, and asking deferment for those who were essential in their present work. Local draft boards, in the absence of specific official instructions, have granted deferment to some essential psychologists in civilian positions.

A recently completed survey of all psychologists offers an opportunity to study the results of this mobilization procedure. The survey was conducted by the Office of Psychological Personnel during December, 1943 and January, 1944. Questionnaires were sent to all members of the national, regional and local societies of psychologists, to all who had registered with the National Roster or the Office of Psychological Personnel, and to others whose names were available from lists of military personnel. Returns were received from 84 per cent, and incomplete information was available for most of the others from directories and service records.

Number of psychologists. Previous estimates of the total number of psychologists have been derived from a variety of data and have ranged from 3,500 to 8,000. The present survey included all members of the American Psychological Association and the American Association for Applied Psychology, and all others who were qualified for membership in either organization (Ph.D. in psychology, or employment in psychological work after one or more years of graduate training in psychology or a cognate field). From these sources 4,553 psychologists were located of whom 3,806 are members of the American Psychological Association.

TABLE I

WAR ACTVITIES OF PSYCHOLOGISTS

	M.A. Degree	*Ph.D. Degree*	*Total*
Total number of psychologists	**1908**	**2645**	**4553**
Men	1179	2012	3191
Women	729	633	1362
Military service	**528**	**478**	**1006**
Army enlisted	121	38	159
Army commissioned	134	144	278
Army Air Force enlisted	98	21	119
Army Air Force commissioned	39	80	119
Navy enlisted*	8	5	13
Navy commissioned*	118	180	298
Discharged	10	10	20
Civilian service			
Full-time government employment	**147**	**290**	**437**
U. S. war agencies	96	146	242
Office of Scientific Research and Development	51	144	195
Part-time war service	**74**	**249**	**323**
Consultant, war agencies	8	81	89
Member of national committee	1	32	33
Testing for induction centers and Civil Aeronautics program	65	136	201
Local volunteer activities	155	252	407

* Including Marines, Coast Guard, and Maritime Service. The discrepancy between these figures and the total of 415 commissioned Naval officers reported by Louttit (*Psychol. Bull.*, 1944, **41**, 253–257) results from the inclusion in the latter article of more than 100 individuals listed as psychologists but not meeting the minimum requirements for inclusion in the present survey.

Military service. A total of 1,006 psychologists have entered the Armed Forces. Thirty-three of these are women, most of whom have been commissioned in the WAVES. The numbers in the several branches of the service are shown in Table I.

It is the opinion of officers of the National Roster that a greater proportion of psychologists are in military service than is true of most other professional groups. The survey offers evidence in support of this opinion. There are 1,487 male psychologists between the ages of 18 and 38, of whom 948, or 64 per cent, are in service. The proportion of the general population in military service is approximately 50 per cent.

The reason for the disproportionate number of psychologists in military service is related to the magnitude of the military needs. Consequently there has been double motivation for psychologists to enter military service: the draft boards have been exerting pressure at one end, while at the other the services have eagerly recruited volunteers through the offer of commissions and the opportunity for professional service.

TABLE II

EDUCATION, RANK AND ASSIGNMENT OF GRADUATES OF THE ARMY SPECIALIZED TRAINING COURSE IN PERSONNEL PSYCHOLOGY

	Per Cent
Education	
Less than four years of college	34.2
A.B. degree in psychology	4.9
A.B. degree in other fields	34.8
Graduate school in psychology	6.0
Graduate school in other fields	20.1
Rank	
Private	4.6
Private First Class	51.8
Corporal	27.3
Sergeant	16.3
Assignment	
Classification	
Army Air Forces	16.1
Army Ground and Service Forces	26.5
*PRU or MPEU (AAF)	15.6
Special Training Units	9.8
Medical Corps	1.1
Test Construction	1.7
Mental Hygiene	1.7
Rehabilitation	.7
Office of Strategic Services	.6
Other psychological duty	2.2
Non-psychological duty	16.4
Unassigned	7.6

* Psychological Research Unit or Medical and Psychological Examining Unit.

Commissions have been available for 70 per cent of those who entered the armed forces and for 86 per cent of those with the Ph.D.

degree. It will be noted that the Navy practice has been more favorable in this respect than the Army's. During the past year the general policy of the Army has been such that almost no direct commissions were available for psychologists and no schools for officer candidates in psychological fields were conducted.

ASTP training in psychology. The need for psychologists as classification specialists and personnel consultants was not adequately met by the supply from Selective Service, and in 1943 the Army established a course in Advanced Personnel Psychology in the Army Specialized Training Program. Approximately 1,300 enlisted men completed the intensive six-month course at eleven selected universities. Table II shows the educational background and present assignment of these men, based upon returns from 956 men in response to a special survey.

Civilian service. Government war agencies have recruited many psychologists for civilian service in the War and Navy Departments, the Office of Strategic Services, the Office of War Information, and particularly in the Office of Scientific Research and Development, which contracts with universities and other institutions for research projects directly requested by the armed services. The turnover of personnel in government war agencies has been considerable, and the numbers

TABLE III

EMPLOYMENT OF PSYCHOLOGISTS JANUARY 1941 AND JANUARY 1944

Employment	*1941*			*1944*		
	Men	*Women*	*Total*	*Men*	*Women*	*Total*
Universities and colleges	1506	369	1875	1104	397	1501
Schools and educational systems	200	224	424	134	228	362
Guidance centers, clinics	100	115	215	79	123	202
Prisons, correctional institutions	76	20	96	53	27	80
Hospitals, custodial institutions	87	59	146	80	103	183
Business, industry, consulting organizations	140	38	178	187	58	245
Public personnel agencies (USES, etc.)	66	7	73	48	20	68
Government agencies	100	27	127	71	33	104
Self-employed	62	34	96	51	34	85
Total	**2337**	**893**	**3230**	**1807**	**1023**	**2830**
U.S. war agencies (including (OSRD)	10	1	11	234	42	276
Military service	9	2	11	953	33	986
Total	**19**	**3**	**22**	**1187**	**75**	**1262**
Advanced graduate students	180	94	274	113	84	197
Non-employed, retired	52	67	119	53	141	194
No information available	81	72	153	37	33	70
Grand Total	**2669**	**1129**	**3798**	**3197**	**1356**	**4553**

presented in Table I include those psychologists who at any time were employed in the work indicated. Table III shows the number actually employed at the time of the survey.

Regular employment. Table III shows that 1,240 psychologists have shifted from their regular employment to the military service or to war agencies. It would be expected that this shift would leave large gaps and dislocations in civilian activities, and in many instances this has been the case. The over-all picture, however, is not too devastating. The total number of psychologists engaged in usual employment has decreased by 400—and this decrease is almost entirely in university employment. In all other categories of employment the increases and decreases have been small, although there has been a considerable lowering of standards as graduate students and others are called into full-time positions.

The apparent discrepancy between the number who have been drawn into war service (1,240) and the decrease in regular employment (400) can be explained by the increase in the total number of psychologists. In normal times the membership of the American Psychological Association increases by about 300 a year. During the past three years this influx of new psychologists from the graduate schools has not been quite enough to balance the number in war service.

During the years of war mobilization there has been an increase in the proportion of women psychologists in civilian employment. While the number of men has decreased 20 per cent, the number of women has increased 15 per cent, which is no greater than the normal expected growth.

The results of the survey will be further analyzed and reported in later articles dealing with the post-war reemployment problem, and with the employment, functions, and training of the various occupational groups of psychologists.

PERSONNEL-PSYCHOLOGISTS AT STANFORD UNIVERSITY

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A class of 109 soldiers was selected by the army to attend a two-quarter training course in personnel-psychology at Stanford University beginning in May 1943. This constituted one of eleven such courses, totalling approximately 1,350 men (4).

Certain data concerning the men trained at Stanford University throw some light on four problems, namely, the validity of ratings, the relation of interests to achievement, the relation of morale to achievement and the factors to be considered in selecting soldiers for training to be personnel-psychologists.

Both soldiers and faculty expressed the feeling that the class contained individuals who should not have been included. Have we learned anything from the experience that would enable the army to select men more wisely next time? This, the last of the above four problems is the central theme of the report: the other three contributions are by-products but worthy of note.

The basis of selection of men for the course, as the writer understands it, was:

1. a score of 115 or higher on the Army General Classification Test (AGCT), that is, from the upper 24 per cent of the white men in the army,*
2. the soldier's willingness to return to college,†
3. the approval of a board of army officers after interview of the student at the camp and the approval of the STAR board at the educational institution, and
4. completion of three courses in psychology.

Actually all the men had scores of 118 or higher on the AGCT (see Table V) but eleven had had no instruction in psychology. Although presumably most of the men had agreed to return to college many of them complained that they had not been consulted as to what instruction they were to receive and claimed that they would not have elected the course if they had had a choice. No check has been made regarding the *fact* that they were consulted or not concerning the personnel-psychologist course nor as to how many *felt* that they had had no choice in the matter.

There is no question, however, that both students and faculty freely discussed a bad morale situation, attributing the cause primarily to the presence of men who did not want to be there and to the uncertainty of future assignments. How much faculty and students were upset by operating college courses under the direction of army men is unknown, but the writer knows he neither expected nor got from the class as a whole the standard of performance he does get from regular students. There were, however, many able men in the class who did satisfactory work.

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* Major T. W. Harrell states that 6 per cent of white men processed at reception camps scored 130 and above and 28 per cent scored 110 to 129. By interpolation 24 per cent scored 115 and higher.

† Certain statements made to the writer indicate that many of the men first selected for the ASTP program were not given any option in the matter.

Originally the class contained 109 men. Thirteen were terminated by the beginning of the second quarter—seven were transferred to other work and six were dropped because of unsatisfactory scholarship. One of the remaining 96 men was so irregular in his attendance during the second quarter that he has been ignored in most of the tables below.

TABLE I

AVERAGE GRADES IN COURSES

Course	*95 Men**	*6 Men*	*101 Men*
Tests and Measurements	5.4†	10.5	5.7
Social Psychology	5.5	9.5	5.7
Statistics	5.3	10.5	5.6
Occupations	5.5	11.5	5.9
Average of 4 courses	5.5**	10.5	5.7
Personnel Procedures	6.2		
Work, Fatigue and Efficiency	6.5		
Interviewing	5.2		
Abnormal Psychology	6.1		
Learning and Perception	4.5		
Average of 5 courses	5.7		

* In second quarter grades are based on 92 cases. 3 did not finish the quarter.

† Grade of A=1, B=4, C=7, D=10, F=13.

** $\sigma=2.6$.

Average grades for the nine courses are given in Table I. In all but the Learning course the distribution of grades approximates the Stanford regulations of assigning A to approximately 15 per cent of students, B to 35 per cent, C to 35 per cent and D to 15 per cent of students who pass the course. There are, however, somewhat less than 15 per cent of D grades in six of the eight classes. The distribution of grades in the Learning course is markedly skewed with 26 per cent of A grades, 46 percent of B, 20 per cent of C, 2 per cent of D and 6 per cent of failures. Even when the records of the three students who were dropped during the second quarter are ignored the grades assigned in the first four courses of the second quarter are lower than the grades of the first quarter—a drop of eight per cent of B grades and a corresponding increase of D and failing grades. Either the faculty raised their standard or the students did poorer work.

Average grades in the first quarter correlate .74 with average grades in the second quarter. Grades in several courses agree better than this but grades in Statistics and Learning vary appreciably from the remainder. Table I presents the average grades in the courses of the 95 men who started the second quarter, the 6 men who were dropped for poor scholarship at the end of the first quarter and the total of 101 men.

Previous Education. Did "number of years of college education" effect the scholastic achievement in this army training program? Also, did "number of courses previously taken in psychology" affect success in the two quarter course largely devoted to psychology courses? If so, would it be possible next time to secure a better sample of army personnel-psychologists by establishing some requirement as to years of college attended and number of psychology courses attended?

TABLE II

YEAR IN COLLEGE AND SCHOLASTIC ACHIEVEMENT IN THE TWO-QUARTER PROGRAM

Year in College	*No.*	*Mean Grade*	*Median Grade*	*Q*
1	6	7.1	5.8	2.5
2	21	6.0	5.8	1.3
3	24	6.1	6.2	1.7
4	36	5.5	5.5	1.7
5–7	9	3.5	3.4	1.9

Table II shows that 36 of the 96 students who started the second quarter were in their senior year when they entered the army, 45 men were in their sophomore and junior years, 6 were freshmen and 9 graduate students. Mean grades suggest a very slight improvement in performance with increasing attendance at college but median grades do not support such a trend. Graduate students did, however, do better work than undergraduates, there being an actual difference of 2/3 of a letter grade, which is statistically significant.

Thirty-two of the men had had the required three previous courses in psychology as shown in Table III. Eight more might be said to meet the requirement as their course in Statistics could well be accepted as a substitute for a third psychology course. This gives a somewhat smaller percentage of men meeting the scholastic requirement than at the University of Chicago (4). Actually 11 men had had no psychology course, 40 had had one course, 32 had had two to three courses, and 13 had had four to six courses. The differences in scholastic achievement are very slight with zero to three courses; what differences there are support the suggestion that no course was a better preparation than two or three. The faculty had the feeling that students with no previous work in psychology felt badly handicapped and worked harder to make up the difference. Whatever the explanation, the fact remains that no previous work in psychology did not prevent satisfactory work. Students with four or more courses did better work than the remainder.

TABLE III

NUMBER OF PSYCHOLOGY COURSES PREVIOUSLY TAKEN AND SCHOLASTIC ACHIEVEMENT IN THE TWO-QUARTER PROGRAM

No. of Courses in Psychology	*No.*	*Mean Grade*	*Median Grade*	*Q*
0	11	5.5	5.7	2.2
1	40	5.8	5.7	1.6
2	13	6.1	6.1	1.5
3	19	6.1	6.0	1.6
4	7	4.6	4.0	1.4
5–6	6	4.1	3.6	0.7

The data in Tables II and III do not include six students who were dropped at the end of the first quarter for scholastic reasons. Their records should be included in this discussion. Data regarding these six soldiers, 3 who had unsatisfactory records and were dropped early in the second quarter and 5 who were dropped at the end of the second quarter, are given in Table IV. These 14 men averaged 2.3 years of college in contrast to 3.2 years for those who succeeded. The former averaged 1.7 courses in psychology in contrast to 2.0 courses for the latter. Neither of these differences is statistically significant.

The criterion of success in this personnel-psychologist course should presumably be successful performance in the army. Neither this criterion nor any close approximation to it is available against which to to check the effectiveness of the training program. It was necessary for students to obtain passing grades from their instructors in order to be continued in the course by the army authorities. Absence of failing grades constituted then a very important part of the total criterion.

Using college grades as the criterion, it is apparent that if only graduate students with four or more courses in psychology had been selected much better grades would have resulted. Since so many excellent men would have been eliminated it is apparent that such a procedure is not practical. It can be agreed, and with justification, that the more advanced students received high grades to a considerable degree because of previous learning, and that their A grades represent less learning than grades of B and possibly C secured by men of no previous psychological instruction. With such complications we cannot cope, however, in this short study. The data, as far as they go, do not support the common custom of requiring elementary psychology before entrance to more advanced courses nor to the restricting of advanced courses to upper division students.

Intelligence. One of the requirements for admission to the Army Personnel-Psychologist Course was a score of 115 on the Army General Classification Test (AGCT). All of the men met this requirement having a range of scores from 118 to 156 and a mean score of 136.7. This is practically the same mean as reported at the University of Chicago, i.e., 134 (4).

TABLE IV

YEARS OF ATTENDANCE IN COLLEGE AND NUMBER OF PSYCHOLOGY COURSES TAKEN BY STUDENTS WHO FAILED IN COMPARISON WITH STUDENTS WHO PASSED

	N	*Average Number of Years in College*	*Average Number of Coursex in Psychology*
Dropped at end of 1st Quarter	6	2.2	2.0
Dropped during 2nd Quarter	3	3.0	2.0
Dropped at end of 2nd Quarter	5	1.9	1.2
Total dropped	14	2.3	1.7
Total of those who completed the program	88	3.2	2.0

Nearly all the men completed the American Council on Education Psychological Examination (ACE). The distribution of scores on the two tests for the 104 men who took both tests is given in Table V. Mean scores are nearly equal but the standard deviation on the ACE is approximately twice that on the AGCT test. The correlation between scores on the two tests is only .492, suggesting that scholastic achievement may be differently associated with the two tests.

Distribution of the scores of the 14 men who were dropped for unsatisfactory work is given in Table V; also the distribution of scores of the 14 men who obtained the highest scholastic grades. There is very little difference between these two extreme groups on the AGCT test, i.e., 7.6. On the ACE test the difference is 21.0 which suggests that this test is superior to the AGCT in differentiating superior and inferior

TABLE V

DISTRIBUTIONS OF SCORES OF 104 MEN WHO TOOK BOTH THE AGCT AND THE ACE TESTS

Scores	*AGCT*	*ACE*	*Average*	*14 Who Were Dropped*		*14 with Highest Grades*	
				AGCT	*ACE*†	*AGCT*	*ACE*
170		1					
160		8	1				2
150	6	13	10			2	4
140	34	14	22	4	1	5	2
130	39	23	31	2	4	5	3
120	20	18	26	6	2	1	1
110	5	23	6	1	4	1	3
100		3			1		
90		0					
80		1			1		
Mean	136.7	134.4	135.8	131.6	121.8	139.2	142.8
σ	9.39	17.5*	10.6				

* σ of 103 cases, omitting score of 81, = 16.8.

† One of the 14 men did not take the ACE test. His score on the AGCT was 123.

TABLE VI

MEAN SCHOLASTIC GRADES OF 95 MEN IN RELATION TO THEIR INTELLIGENCE TEST SCORES (AGCT AND ACE TEST SCORES AVERAGED)

	Intelligence Test Scores				
Courses	*110–129 N=31*	*130–144 N=45*	*145 N=19*	*Difference 1st and 3rd Groups*	*Critical Ratio*
Average of 4 courses, 1st Quarter	6.4	5.3	3.9	2.5	4.5*
Average of 9 courses, 2 Quarters	6.1	5.6	4.6	1.5	2.3

* When 10 additional men, who had failed or been transferred to other work, are included the three mean grades are, respectively, 7.4, 5.4, and 4.6, a difference of 2.8 with a critical ratio of 4.1. Two of the men transferred elsewhere had high intelligence and low grades of C− and D.

scholarship. But the correlations between grades and AGCT and ACE do not support this hypothesis since the former is .31 and the latter only .34.

The data in Table VI indicate that during the first quarter those with high intelligence averaged 2.5 thirds of a letter grade higher than those with low intelligence—a statistically significant difference. But the difference between the two groups dropped to 1.5 thirds of a letter grade when grades for all 9 courses are considered.

Correlation between grades in the nine courses and intelligence test scores are given in Table VII. The results in the preceding table should prepare us for the fact that the correlations are lower during the second

TABLE VII

CORRELATION BETWEEN SCHOLASTIC ACHIEVEMENT AND INTELLIGENCE, PSYCHOLOGIST INTEREST AND PERSONNEL INTEREST

Courses	*N*	*Intelligence*	*Psychologist Interest*	*Personnel Interest*
Tests and Measurements	95	.355*	.318	
Social Psychology	95	.150	.336	
Statistics	95	.257	.138	
Occupations	95	.287	.246	
Average of 4 courses	95	.330	.314	.225
Personnel Methods	93	.089		
Work, Fatigue, Efficiency	93	.064		
Interviewing	93	.235		
Abnormal Psychology	93	.200		
Learning	93	−.060		
Average of 9 courses	93	.197	.275	.230

* The standard error of a zero correlation with population of 95 is .103. On this basis only coefficients of .31 or higher are statistically significant. Omitted coefficients are statistically insignificant.

quarter than the first quarter, as the table makes clear. In both cases the coefficients are low, i.e., .33 and .20, respectively. If data on ten additional men who failed the first quarter or were transferred elsewhere are included, the coefficient of .33 is raised to .43.

There is no evidence here that raising the minimum AGCT test score above 115 for admission to the course would have appreciably improved the scholarship. To have raised the requirement to 120 would have eliminated one poor student, three satisfactory and one superior; to have raised the minimum to 130would have eliminated seven failures, sixteen satisfactory and two superior students.

Interests. A slogan frequently displayed in army personnel offices is: "Place the man in the work he can do and likes the best." From the comments of many members of this class it is evident that they felt they had not been consulted as to whether or not they would like to become personnel-psychologists. Several secured transfers to other work early in the course. Scores on the Vocational Interest Test make clear that the class was very heterogeneous in their interests and that many did not have the interests common to personnel managers and especially to psychologists.

The distributions of psychologist and personnel manager interest scores of the 95 men who began the second quarter are given in Table VIII.

TABLE VIII

PSYCHOLOGIST AND PERSONNEL MANAGER INTEREST SCORES OF THE 95 PERSONNEL-PSYCHOLOGISTS.

Rating	*Score*	*Psychology Interest*	*Personnel Interest*	*Higher of Either Psychology or Personnel Interest*
A	60		5	5
	55	1	2	3
	50	4	18	20
	45	3	8	9
B+	40	3	16	16
B	35	5	18	17
B−	30	4	7	6
C+	25	10	11	11
C	20	13	3	3
	15	12	4	5
	10	12	1	
	5	9	2	
	0	6		
	−5	6		
	−10	6		
	−15	1		
Mean		18.9	40.0	41.4
σ		16.1	12.4	

On the average these men have a B+ rating in personnel but a low C rating in psychology. In fact their average score in the latter is equal to what would be obtained by chance. On the basis of interest scores alone we would advise 8 of the 95 men to become psychologists and 33 to become personnel men. Considering both A, B+ and B ratings we would consider 16 of the 95 for psychologist and 67 of the 95 for personnel work.

If we consider that a man is qualified for this army course if he has a high interest score as either a psychologist or a personnel man we find from the distribution of such scores (last column in Table VIII) that 37 men rate A and 33 more rate B+ or B, a total of 70 among 95. This leaves 25 men with ratings of B− and lower. Even on this basis a fourth of the men are presumably not being fitted for work in harmony with their interests.

When the interest records of the 95 men are averaged for each occupation we have the following ratings typical of the group as a whole:

Rating of B+	Office worker Realtor Social science teacher
Rating of B	Personnel manager Sales manager Accountant Life insurance salesman Purchasing agent Advertising man

Such an interest profile approximates that of the average business man, except that the latter would also have a B+ rating in production manager.

All scientific interests are rated low, i.e., engineer and chemist (22), physician (20), psychologist, architect and dentist (17) and mathematician (15). Such interests correlate .40 to .77 with those of psychologists and −.08 to −.51 with the interests of personnel men.

If we consider the highest occupational interest of each man we have the following distribution of interests.

12.7*	Personnel manager
9.1	Office man
8.3	Social science teacher
6.5	Accountant
6.5	Sales manager
5.3	Lawyer
4.3	Realtor
4.0	Farmer

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* When two or more occupations are tied for a man's highest score, each occupation is given proportionate weight.

3.8	Advertising man
3.8	Mathematics-science teacher
3.5	Purchasing agent
3.5	Aviator
3.0	Life insurance salesman
2.0	Each of Printer, Banker, President and Production manager
1.5	Psychologist
1.3	Certified public accountant
1.0	Each of Y.M.C.A. physical director, Forest service and Chemist

Such interest scores indicate a heterogeneous group of men, the majority having business interests of various aspects except that of production, with the interests of personnel men being more common than any other. The group contains few men with any kind of scientific interests—so few in fact as to make certain that it is not a random sampling of college students. Our guess is that men with scientific interests were directed into engineering, medicine and other similar pursuits and the remainder were considered for personnel-psychologist. Such a program is permissible as far as selecting personnel men is concerned but will not provide men with the scientific interests found among psychologists.

What relationship exists between interest scores and scholastic grades? Several correlations between psychologist interest scores and grades are given in Table VII. They approximate the correlations between intelligence and grades for courses in the first quarter and are slightly higher for the second quarter. Correlations between personnel interest scores and grades are lower than those concerning intelligence or psychology interest during the first quarter and about equal to them for both quarters. In general, grades correlate about equally with intelligence and psychologist interest during the first quarter and correlate slightly higher with the latter than the former during the second quarter.

Correlations do not always reveal the extent to which the superior and inferior in one respect are differentiated in a second regard. Table VI shows that during the first quarter the superior in intelligence earn 25/30 higher letter grade than the inferior (critical ratio of 4.5), Table IX shows similarly that the superior in psychology interest scores earn 23/30 higher grades (C.R. of 4.1) and Table X shows that the superior in personnel interest scores earn 15/30 higher grades (C.R. of 2.3). For the entire two quarters the differentiation is less in all three respects—here the superior in psychology interest scores earn 2/3 higher grades than the inferior (C.R. of 3.1) and the superior in both intelligence and personnel interest earn only 1/2 higher grades with critical ratio of 2.3.

Several complications must be taken into account:

1. The range of intelligence scores is greatly restricted in contrast to the wider distribution of interest scores, which implies that higher correlations

TABLE IX

Mean Scholastic Grades of 95 Men in Relation to their Psychology Interest Scores

Course	*−15 to 14* *N=40*	*15 to 29* *N=35*	*30 to 59* *N=20*	*Difference 1st and 3rd Groups*	*Critical Ratio*
Tests and Measurements	6.1	5.7	3.0	2.9	5.2
Social Psychology	6.5	5.3	3.7	2.3	3.6
Statistics	5.6	5.5	4.3	1.3	2.0
Occupations	6.4	5.4	4.1	1.9	2.9
Average of 4 courses	6.1	5.4	3.8	2.3	4.1
Personnel	6.3	6.5	5.7	0.6	—
Work, Fatigue, Efficiency	6.9	6.6	5.5	1.4	1.4
Interviewing	5.7	5.7	3.4	2.3	3.2
Abnormal	6.9	6.4	3.8	3.1	3.4
Learning	4.8	4.1	4.6	0.2	—
Average of 9 courses	6.4	5.7	4.4	2.0	3.1

TABLE X

Mean Scholastic Grades of 95 Men in Relation to Their Personnel Interest Scores

Course	*5 to 29* *N=21*	*30 to 44* *N=41*	*45 to 64* *N=33*	*Difference 1st and 3rd Groups*	*Critical Ratio*
Tests and Measurements	6.2	5.3	4.9	1.4	1.6
Social Psychology	6.8	5.7	4.5	2.3	3.1
Statistics	5.6	5.1	5.0	0.6	—
Occupations	6.3	5.9	4.5	1.8	2.4
Average of 4 courses	6.4	5.5	4.9	1.5	2.3
Personnel	6.6	6.5	5.6	1.0	—
Work, Fatigue, Efficiency	6.1	6.9	6.2	−.1	—
Interviewing	6.2	5.4	4.4	1.8	2.1
Abnormal	6.8	6.2	5.5	1.3	—
Learning	4.9	4.8	3.8	1.1	—
Average of 9 courses	6.6	5.9	5.1	1.5	2.3

might be expected with intelligence than with interest scores if a good sample of men in general was available.

2. Only a few score high on the psychologist interest scale thereby preventing a fair comparison between those rating A and those rating C. It is possible that better differentiation might be obtained with this scale if there was a good representation of men with A ratings.

3. The personnel interest scores contain 33 A ratings but no scores below zero. A better measure is possible here than with the other two tests but higher correlations should be expected if there were scores below zero.

Since psychology and personnel interest scores of these men correlate .28* it seemed likely that some combination of the two sets of interest scores might provide better differentiation than either one alone. Averaging the two sets of scores gives about the same differentiation as secured with psychology interest scores alone and better differentiation than obtained with only personnel interest scores.

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* When the records of 285 college seniors are correlated a coefficient of −.08 is obtained instead of .28. See (3 Table 193).

Averaging the two sets of interest scores is one possible way of combining such scores. It can be argued that possession of high interest in either field would be sufficient to provide proper motivation for all courses since they are required for advancement in the two fields in the army. Slightly less differentiation was obtained, however, between superior and inferior students when the higher score in the two fields was alone used than when the two scores were averaged.

Neither of the two interest scores differentiated satisfactorily the superior and inferior students in statistics. Accountant and mathematician interest scores differentiated such students even less well than psychology interest scores.

As a check upon the above calculations we determined the differentiation between superior and inferior students using advertising interest scores. This scale was selected as scores on it correlate about zero with scores on both the psychology and personnel interest scales. The differentiation here was −.1, that is, the students with low scores averaged 1/30th of a grade higher than the students with high scores.

Psychology interest scores correlate .38 with scores on the Thorndike Intelligence Examination for High School Graduates (see Strong 3 Table 193) but these interest scores correlate only .20 with an average of the scores on the AGCT and ACE. Corresponding correlations with personnel interest scores are −.02 and .05. Since psychology interests correlate higher with intelligence than do personnel interests it is natural to suppose that the better differentiation of superior and inferior students with the psychology scale than with the personnel scale is attributed to the former's association with intelligence. When intelligence is partialed out the correlation of .314 between psychology interest and grades is reduced to .248 and when psychology interest is partialed out the correlation of .330 between intelligence and grades is reduced to .288. The approximately equal partial coefficients suggest that both intelligence and psychologist interest contribute about equally to grades in these courses.

The relation of interests to ability has not yet been satisfactorily determined. One difficulty in making such studies has been the lack of proof that the interest test measurements reflect the interest that is being investigated. A second difficulty has been to secure data on people engaged in the activity who have low interest scores. Among several hundred engineering students, for example, practically none had low engineering interest scores although there were many non-engineering students with high engineering interest scores. The above data are significant in this respect that they include a wide range of interest scores. The fact that such interests are related to achievement to the same extent as is intelligence is significant, even though in this case all the correlation coefficients are low.

It is obvious that a better selection of students could have been obtained if only those with B+ and A ratings in personnel and especially psychology had been selected. But as in the case with intelligence test scores, to do this would have resulted in the elimination of many men who did perfectly satisfactory scholastic work.

Occupational interest scores were designed to measure not scholarship but turnover, i.e., extent to which people would like the work and continue in it. We do not have the opportunity to determine the real validity of the interest scores for lack of a criterion involving both performance and continuance in the work for an appreciable period of time.

Morale. Another factor that may have influenced grades in this training course is morale. As a class exercise in the course on Personnel Procedures, the students recorded their attitudes on Wood's morale test; called by him Segment Evaluation Scale (5). The employees tested by Wood averaged 7.0 on a scale from 1 to 10; the personnel-psychologists averaged 6.0, indicating somewhat poorer morale.

A comparison of the mean scores of the two groups by segments follows, differences of 1.0 or more alone being reported.

	Wood's Employees	*Personnel-Psychologists*	*Difference*
Favors	6.3	7.5	1.2
Plans	7.4	6.2	−1.2
Suggestions	7.8	6.6	−1.2
Interests	7.0	5.6	−1.4
Career	7.0	5.6	−1.4
Instructions	7.7	6.2	−1.5
Responsibilities	8.6	7.1	−1.5
Advancement	6.8	4.9	−1.9
Outside influences	7.6	5.4	−2.2
Nature of work	8.3	3.8	−4.5

Evidently, it was the nature of the work they were engaged in that most annoyed these soldiers.

There was no relationship between intelligence and morale, as measured here, for those with morale scores of 6.0 to 8.3 averaged 135.4 in intelligence and those with morale scores of 2.8 to 5.9 averaged 137.6. During the first quarter grades of the soldiers with above average morale averaged 4.8 and those with below average morale averaged 5.5, a difference of 7/30 of a letter grade (correlation of .21). The corresponding averages during the second quarter are 4.6 and 6.4 a difference cf 18/30 of a letter grade which has a critical ratio of 3.2 (correlation of .28). The closer agreement between grades and morale during the second quarter than the first quarter is appropriate since the morale test was administered during the second quarter.

The relationship between morale and grades during the second quarter is probably greater than that indicated above for 15 soldiers were either absent or did not turn in their blanks. Ten of the 15 constituted 10 among the 11 men who had average grades of D and less during the second quarter.

When the class is divided into two groups according as their grades are higher or not in the second quarter than the first quarter, we find the intelligence test scores of the two groups to be 130.9 and 138.5, respectively, and the morale scores to be 6.6 and 5.3 respectively. (The difference in intelligence test scores has a critical ratio of 2.5 and the difference in morale scores has a critical ratio of 3.3.) The tendency is for men below average in intelligence and above average in morale to improve their grades and for men above average in intelligence and below average in morale to do poorer work in the second quarter than the first.

Many of the superior students had below average morale scores but none of the students with grades of B— and lower had above average morale scores. It would be interesting to know whether (1) poor morale causes poor scholarship but that good morale does not produce good scholarship or (2) poor grades cause poor morale but good grades do not produce good morale.

Hersey found that "men are more productive in a positive emotional state than in a negative" (difference of 8.5 per cent) (1, pp. 289–290). But it is to be noted that employees with positive emotion exceeded those with neutral emotion by only 1.4 percent whereas employees with negative emotion dropped below those with neutral emotion by 7.1 per cent. Positive emotion increased production very little but negative emotion affected production appreciably. His conclusion is in harmony with our finding that poor morale has more effect upon achievement than good morale, or that good grades affected morale less than poor grades.

Grumbling or complaining is indulged in by many men. Such is the inalienable right of the enlisted men according to one authority. A general confided to the writer that he would be most seriously disturbed if he heard that his men were not complaining. Whether such conduct is merely a form of conversation or symptomatic of bad morale is unknown to the writer. Attitudes supposedly measured by morale scales is another phenomenon. What a man will do in action is still a third phenomenon. In this study we do not know how well Wood's scale measures what it purports to measure. We know that the scores are related somewhat to grades. Grades are important to the extent that poor grades eliminate the man from the program.* We do not know whether the morale scores are related to subsequent performance on the job.

Ratings by students. Each student rated himself and was rated in turn by five members of the class on the rating scale given by Pennington et al. (2, pp. 182–183). This scale is "used in selecting candidates for the officer's training school." Several additional items were included. Only three items are considered here pertaining to a good worker, i.e.: "He shows persistent energy on the job," "He finishes work he begins," "Would you select him as your assistant in charge of research for which you are responsible?". On the first two of these items the ratings ranged from 0 to 2 and on the third item from 1 to 5. For the three items the possible range was from 0 to 9, the actual range was 3.8 to 9 with an average of 7.3 for the averages of five student ratings on a fellow student.

To show that there was appreciable discrimination in the ratings these correlations are given.

Average of ratings pertaining to "bearing" vs. average of ratings pertaining to "leadership"	.83
Average of ratings pertaining to "bearing" vs. average of ratings pertaining to "good worker"	.39
Average of ratings pertaining to "leadership" vs. average of ratings pertaining to "good worker"	.43

The ratings for "good worker" correlate .77 with grades in the first quarter and .59 in the second quarter. The drop in correlation from the first to the second quarter is all the more significant in that the ratings were made about half-way through the second quarter. It is to be noted that these are the highest correlations with grades reported in this study and are in fact the only correlations that may be called "high" in the study.

The faculty assigned the members of the class who were finishing the two quarter course to one of seven classifications, three of which may be ignored as they had only from zero to five men assigned to them. The remaining four classifications with the average "good worker" ratings assigned them by students were

1. good apparatus man	7.77
2. interviewer	7.85
3. administration assistant	7.36
4. no good for personnel	5.80

The differences in rating between the last group and the first three are all statistically significant, for example, the difference between classes

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* Grades have other values but in this case as far as we know differences in passing grades were not considered by the army in assignments to work.

3 and 4 is 1.56 with a critical ratio of 3.8.* Students and faculty agreed quite well as to who were the unsatisfactory members of the class, although there were some individual exceptions.

Students' opinions as to who are the hard workers in the class agreed with grades, which is quite natural as the grades of fellow students are generally known. But these opinions are not related particularly to the factors considered above, as the following correlations indicate

Rating on Good Worker vs. Intelligence	r = .187
Rating on Good Worker vs. Personnel Interest	r = .16
Rating on Good Worker vs. Psychologist Interest	r = .24
Rating on Good Worker vs. Morale Rating	r = .25

If scholastic grades are a good measure of "persistent energy on the job," "finishes work he begins" and "good assitant in research," then we may conclude that the average of five ratings by fellow students has fairly good validity (correlation of .59 and .77). We must certainly conclude that they have greater association with scholastic performance than do test measurements of intelligence, interest and morale.

Conclusion. The personnel-psychologist course had at least two criteria—passing the two quarter course, where faculty grades were the measure, and satisfactory performance on the job. This study is concerned with only the former of these two quite different criteria.

Among a group of men with at least a score of 115 AGCT and who had previously attended college, it made little or no difference as measured by scholastic achievement whether they were freshmen or seniors and whether they had had none or three courses in psychology. Graduate students and those who had had four or more courses in psychology did better work than the remainder.

Test scores of intelligence and interest proved to be slightly related to grades, morale scores less so. Superior men in intelligence earned 5/6 higher letter grade than inferior men during the first quarter. The same relationship held for psychologist interest on the Vocational Interest Blank. For the entire two quarters the differences fell to 1/2 letter grade in the former case and 2/3 letter grade in the latter. Men with superior scores on a morale scale were superior by 1/2 letter grade to those with inferior morale scores. The correlation here ranged from .20 to .30—too small to be of practical significance. Ratings by fellow students on what seemingly is "willingness to work" yielded correlations of .77 and .59 with grades in the first and second quarters, respectively.

It looks as though "willingness to work" was more important in this particular group of men than intelligence, interest and morale. Or possibly we should say that test measures of intelligence, interest and morale do not measure willingness to work.

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* The differences between the four classes in terms of morale ratings are of the same order but of lesser degree, none being statistically significant.

Raising the minimum requirement in intelligence (115 AGCT) and requiring certain psychology and personnel interest scores would have eliminated too many men who did satisfactory scholastic work to be feasible. On the other hand, such requirements might prove to be desirable in the light of a two to five year follow-up.

Where soldiers are known to each other, ratings by them might aid in selecting a superior group, as their ratings correlated higher with grades than any other measure of proficiency.

The writer has always favored elective over required courses because the student has to decide that he will take the course and seemingly once he has so decided, he takes what comes with much better grace. In the same vein the writer believes these soldiers should have been given the opportunity of deciding whether they would take the personnel-psychology course or not. The validity of both these hunches needs to be established. We really ought to know how far drafting men affects achievement.

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BOOK REVIEWS

Wolff, H. G., Gasser, H. S. & Hinsey, J. C. (Eds.) Pain. Baltimore: Williams & Wilkins, 1943. Pp. xii+468.

For the second time in ten years the Association for Research in Nervous and Mental Disease has devoted its annual meeting to the consideration of sensory mechanisms and their disturbances. The restriction of the present volume to pain reflects the recent revival of research interest in this field, due in part to the urgency of war-time need. In large measure this interest has been centered in Cornell University Medical School, especially in the work of Harold G. Wolff and his associates. It is therefore fitting that Dr. Wolff should have served as president of the association for this meeting, as chairman of the editorial committee, and as collaborator in six of the thirty-two papers presented. Half of these papers, it might be added, were contributed by members of various departments in Cornell University Medical School.

The volume opens with a concise summary of the striking researches of Hardy, Wolff, *et al.* on the pain threshold for radiant heat. This brief chapter reviews the evidence for their assertion that the perceptual pain threshold is virtually uniform in man, despite great variability in "reaction" to pain. This theme recurs in many papers throughout the book, although in the final chapter an important qualification is added by Wolff and Goodell. Attitude and suggestion are reported there to have raised pain thresholds as much as thirty percent in some subjects, contrary to results reported in their original publication. But the authors still maintain that if the subjects are carefully instructed in procedure, in the criteria of pain and in the maintenance of an attentive attitude, individual differences in thresholds are slight. This remarkable generalization has naturally caused psychologists to wonder whether or not the experimental conditions might not somehow have operated to mask individual differences in sensitivity. The original articles are not very explicit on the psychophysical procedure employed and the papers in this volume are still indefinite on this point. An ascending series of intensities of radiant heat was used, with "thirty to sixty seconds" between successive exposures. The time required for a single threshold determination is said to have been "usually less than two minutes." These two specifications would mean that as a rule only two to four "steps" were used in an ascending series of trials, and if these steps were gross enough a concentration of threshold measurements might well have occurred. This is only a possibility, however, and further research should be undertaken to determine the effects of systematic use of finer gradations of stimulus intensities.

It is possible to classify the thirty-two studies into five major groups, although there is some overlapping among the categories:

1. experimental studies of pain sensitivity, of anomalous types of pain and of localization (7 chs.);
2. studies of the peripheral and central mechanisms in pain (4 chs.);
3. clinical investigations of the character and causes of pains arising in different areas of the body (13 chs.);
4. studies of the effects of pain upon certain visceral functions (2 chs.);
5. studies in the management of pain by surgical, pharmacological and psychological means.

The contributions vary markedly in research value and in literary quality, but in most of them psychologists will find clues to their lack of success in providing a satisfactory scientific account of pain. At the risk of great oversimplification, two classes of these clues will be briefly discussed.

The psychologist's difficulties with pain have been manifold but many of them relate to the failure of pain to exhibit systematic correspondence to stimulus intensity. At least a partial explanation of this irregular behavior is suggested in the two chapters on the peripheral mechanisms in pain. Gasser's excellent discussion of pain-producing impulses in peripheral nerves presents clear evidence that there are two classes of pain fibers, corresponding to the "double pain responses to single stimuli which have been rediscovered a number of times." And Tower describes experiments which show that these two types of fibers are differently distributed in the skin: the fast-conducting, myelinated fibers in the epidermis and the slow-conducting unmyelinated fibers in the dermis. These facts, together with Tower's demonstration of the ramifying, plexiform distribution of the terminal branches of the pain receptor unit, probably account for much of the anomalous behavior of this black sheep of the sensory family. A stimulus applied to the skin would elicit not merely a complex pattern of nervous activity in the dual pain fibers, but would also affect touch or temperature fibers, or both. It is little wonder that psychologists have not been able to establish anything like the Weber function for such a mechanism.

But perhaps more important than the delineation of the complex character of the peripheral mechanism is the conception of pain as a general psychobiological function. This frame of reference is established by the emphasis of Wolff and his collaborators upon individual differences in "reaction" to pain, and the theme runs throughout the book. Yet there is no very sustained, systematic discussion of this point of view or of its implications for a psychology of personality. For the most part the argument is incidental and implicit, although it comes prominently to the surface in the paper which describes an amazing case of insensitivity to pain. In this chapter Kunkle and Chapman report the results of prolonged tests and experiments carried out upon a twenty-five year old corporal, of Italian ancestry, in the United States Army. Both his life history data and the laboratory results showed almost complete insensitivity to ordinarily painful stimuli. The authors believe that hysteria as an explanation was ruled out, that there was a genuine defect in "perception" of pain since many of the reflex "reactions" to pain were absent. (This result, incidentally, is at variance with the doctrine of Hardy and Wolff that the pain threshold is uniform in different individuals.) The perceptual defect in this subject was apparently associated with a poorly developed sensory vocabulary.

There are many other research and observational items which will unquestionably enrich the scientific version of pain. The relation of the cortex to the production and regulation of pain, for example, should be clarified by the chapter of Michelson on the effects of cortical lesions. He presents five cases in which irritation at the cortical level apparently produced pain, not as a thalamic release phenomenon but as a direct influence upon cortical tissue. There are other items in the book which are somewhat discouraging, such as the occasional revival of Head's somewhat archaic "protopathic-epicritic" hypothesis. But this lapse is challenged in the discussion which follows one of the papers, as are many other questionable assertions throughout the volume. The entire work is an impressive scientific production which should encourage psychologists to return to the problem of pain. And it should teach them that an adequate methodology will probably conceive pain not as an isolated sensory dimension but as a complex psychosomatic function.

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KLÜVER, HEINRICH, (Ed.) Visual Mechanisms. Biological Symposia Vol. VII. Lancaster, Pa.: The Jacques Cattell Press. 1942. Pp. viii+322, 1 plate.

The editor in his "Foreword" very aptly calls attention to the wide diversity of the problems in vision. The discussions in this symposium, though restricted to the biology of vision, attack the question from many widely different angles. Every paper is limited to a special problem, or group of problems, with which its writer had had direct experimental experience, yet they do more than present experimental evidence in the style and terms that would be used in reporting data in technical journals of the special fields. Instead, without sacrificing the precision of such data, the writers have interpreted them so that they become available to workers in adjacent fields. The reader must, of course, make his own over-all integration of the group of papers.

The symposium begins with a report of experiments on the *Energy Relations in Vision* by Selig Hecht. Determinations were made of the least amount of energy necessary for the subject to "see a flash" of short duration under dark adaptation (7). From his data Hecht concludes "that in order to see, it is necessary for only 1 quantum of light to be absorbed by each of 5 to 14 retinal rods," or "that 1 molecule of visual purple needs to be changed simultaneously in each of 5 to 14 rods, in order to produce a visual effect (13)." He argues that, in the liminal determination of this experiment where the quantal character of light is the limiting factor, "the properties of light itself limit and define the properties of vision (18)."

The next problem is that of the photochemistry of vision, two aspects of which are discussed in papers on *The Photochemistry of Visual Purple* by Arlington C. Krause and on *Visual Systems and the Vitamins A*, by George Wald. In the first of these, is presented a study of visual purple and its related carotenyl substances showing the known photo-reactions of several of them with their possible relations to the functions of the retina. The other paper extends the study of the photochemicals of the retina to show reactions of Vitamin A and absorption characteristics of the several retinal substances. E. Gellhorn discusses *Anoxia in Relation to the Visual System* thus maintaining touch with the chemical aspect of vision but noting certain of its effects by way of psychological (negative after-images) physiological (reflex) and physical (electroencephalographical) data.

Having left the photochemical aspect of vision, the symposium now takes up some of its physiological problems in *Visual Sensation and its Dependence on the Neurophysiology of the Optic Pathway* by S. H. Bartley. He attempts first to work out quantitative correlations of certain aspects of neurophysiology with the visual end-product. After that "certain ideas about the performance of the functional units in the visual pathway can be deduced from the details of sensation in connection with the overall records obtained from the pathway (8)." Finally "the aspects of visual experience for which no direct physiological correlates can be found must accrue from the relations of various activities." In such correlations, of course, the psychological data must be obtained with as careful methodology as the physiological.

The remaining seven papers tend toward anatomical and histological examination of the organic structures involved in vision with, of course, an emphasis upon the functions of those structures. T. J. Case discusses the *Alpha Waves in Relation to Structures Involved in Vision*, citing evidence from a number of cases with lesions in various cortical structures. W. H. Marshall and S. A. Talbot present *Recent Evidence for Neural Mechanisms in Vision Leading to a General Theory of Sensory Activity*. G. V. Borin, H. W. Garol and W. S. Mc Culloch contribute an experimental study of the *Functional Organization of the Occipital Lobe* in which by strychninization they demonstrate the functional distinction of 3 areas in the visual cortex of the chimpanzee viz. striate, parastriate and preoccipital. S. L. Polyak has condensed his work on the *Anatomy of the Retina* into 9 well-filled pages, and G. L. Walls has given a similar summary of *The Visual Cells and Their History*. H. Klüver, editor of the symposium, contributes a discussion of the *Functional Significance of the Geniculo-Striate System* and K. S. Lashley concludes the series with a consideration of *The Problem of Cerebral Organization in Vision*.

Quite as important as the positive contributions in these papers, are the criticisms that will occur to serious and experimentally minded readers, for questions so raised may be the starting points for new investigation. It is with this in mind that the reviewer ventures to point out typical considerations that might well be given further and other study. One must not forget, for example, that in the first paper Hecht is dealing only with dim or twilight vision, so that care must be taken if one infers anything from the data as to what may happen in daylight color vision. Hecht is perfectly clear on the fact but does not give the warning. Where psychological techniques enter into the experiment, there is reason to question the methods used. Judgments obtained by a method of adjustment in which the observer has considerable knowledge of the nature of the problem and the bearing of his reports have been generally rejected by psychologists as invalid. Mere convenience is not sufficient reason for using them. Likewise, the "threshold" is a well enough defined concept in psychology not to need a special definition in a particular problem. We are left wondering just what Hecht measured.

It is precisely where the biological observations impinge upon the psychological that stimulating questions are raised. For example, Bartley very definitely sets off "the experience of *brightness*" (88) from the "response to *intensity*" (101) of stimulus although he does not stick to it when he discusses "judgment of intensity" as brightness discrimination. Also it is questionable whether when an observer sees a "flash" from the "on-response" he is "without immediate consciousness of duration (89)." Certainly a "flash" is a distinctive durative perception. Marshall and Talbot also face the problem of the relation of "brightness to magnitude of electrical response (121)" and we would point out that the judgments of brightness should not be more casual than the measurements of electrical response. Not only are we not encouraged by the casualness of the correlation that "the 'off' response . . . signals a subjective sensation of darkness (121)" but we are impelled to point out that nowhere has anyone faced the question of the response correlated with sensory black. A consideration of the psychological fact that the black-gray-white series is not intensive but qualitative might suggest a new direction of physiological attack.

There is the other side of the picture as well. Psychologists who read the discussions of Polyak and of Wall can scarcely go back to the simple interpretations of retinal activity that is found in so many current textbooks. Over-simplification is less desirable than confession of ignorance. Klüver has been at some pains to point out in the beginning of his article the fallacies of premature correlations which purport to speak the final word. He brings together, on the other hand phenomena of the central cortex and of stimulus conditions in the search for parallels in the two systems. This is a procedure that stimulates further investigation. What is true of the few cases specifically mentioned is, in general, true of the whole symposium. We shall profit by more such discussions.

We have one criticism of the form of publication that seems important. The usual custom of definitive running heads on the right hand pages has not been followed. This makes it difficult for a reader to orient himself in the text, especially since the various papers over-lap in their subject matter. It may not be necessary to follow a text-book type of subject indexing, but identification of every article by author or by title would greatly improve the book.

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LUCK, J. M. and HALL, V. E. (Ed.). Annual Review of Physiology. Stanford University, Annual Reviews, Inc., 1942. Pp. viii + 709.

In this volume is reviewed the research literature of physiology appearing in the two or three years prior to 1942 and especially between September, 1940, and August, 1941. There are 23 chapters, each dealing with a topic in which research has been active during this period and each written by one or more specialists in the particular field. Bibliographies of literature cited in the various reviews total about 4000 references. At the end of the volume is an author index of more than 4000 items and a subject index, 56 pages in length and containing about 6500 items.

Because of limitations of space, the volume represents a compromise between a detailed, critical treatment of selected subjects, on the one hand, and an all-inclusive classified bibliography, on the other hand. In general, an extremely comprehensive review of experimental physiology has been achieved, but many of the reviewers have had to select certain aspects of their subject, which appear to have made the most significant advances in the period of the review or which may be closest to their interest and competence, leaving other aspects of their topic for treatment by another reviewer in a later volume. The result is a well balanced treatment which, as reviews of this kind go, is remarkably readable and gives a good overall picture of what is going on in the respective fields.

Approximately half of the volume, since it is written by physiologists for physiologists, is of no interest to the psychologist except that, here and there, it contains brief treatments of such psychophysiological problems as: inheritance of neurotic behavior, physiological fields and gradients in ontogenetic development, inductive influences in embryonic differentiation, nerve-muscle specificity in behavior, pituitary and adrenal factors in the polydipsia of diabetes insipidus, pituitary and thyroid influences upon appetite, metabolism and hibernation behavior, metabolism of different brain structures, experimental hypertension, and factors in gastric motility.

The second half of the volume is made up largely of sections and chapters which the physiological psychologist will want to read either because they treat basic physiological problems or because they review the material of physiological psychology itself. In the first category is a three page section on physiological shock (Hertzman), *The Physiology of Reproduction* (Hisaw and Astwood), and *The Autonomic Nervous System* (Hare and Hinsey). Also of this background character but especially worth reading are the chapters on *Electrophysiology* (Girard), *The Spinal Cord and Reflex Action* (Ruch), and *The Central Nervous System* (Hines). This latter chapter is an excellent review of recent work on physiological anatomy of the nervous system as well as of work in the neural mechanisms of sensory discrimination and learning.

Reviews of material in physiological psychology proper are to be found in a section of *The Physiology of the Skin* (Baird, Lever, and Spies), which considers the physiological basis of cutaneous perception, *Sense Organs* (Hartline), which is oriented in large part toward psychophysiological problems of perception, and *Physiological Psychology* (Richter). This latter chapter may disappoint the reader, on first glance, because it does not pretend to cover the field even for the period of review but is limited to the problem of total self-regulatory functions of the organism as seen principally in dietary selection. This chapter makes a great contribution, however, in the breadth and detail of its treatment of this recently very active and fruitful field of psychophysiological research.

When one considers the limitations of space and the fact that such a volume is only one in a series, in which the topics selected and the emphasis given to each can be, and are, varied from year to year, there is no important criticism which can be made of it. It constitutes, on the other hand, an indispensable reference book for the physiological psychologist, as well as the physiologist, for it will enable him to keep up with current work in his field with much greater economy and surity than he otherwise could, no matter how ardent his attempts to follow the literature directly or by means of other available reviewing and abstracting sources. Indeed, with such a volume as this, he can more easily keep abreast of physiology than of psychology, since psychologists have not yet followed this excellent example by initiating an Annual Review of Psychology.

Clifford T. Morgan.

Harvard University.

Roberts, W. H. Psychology You Can Use. New York: Harcourt, Brace, 1943. Pp. vi + 246.

The title of this book suggests another in a fairly long list of popular books on the social and emotional aspects of personality. It is however a layman's general psychology, with only one short concluding chapter given to personal adjustment. The remaining eighteen chapters are allotted as follows: one chapter on habit, five on sensation, four on attention and perception, one on feeling and emotion, three on reflexes, instincts, and nature-nurture, and four on intelligence and intellective processes.

The discussion of facts and principles, particularly the section on sensory experience, is replete with homely but telling illustrations drawn from daily experience and from various kinds of employment. Certain of the schematic diagrams of sensory modalities and a number of the classical experiments in psychology are described, most of them being attributed to their authors by name. Occasional use of dates serves to orient the reader to the recent development of the science. Throughout the book, popular superstitions and beliefs about psychological phenomena are discounted or disproved by evidence and illustration, though no mention of psychical phenomena, or "mysteries of the mind," is made.

The author's style is simple, yet dignified and avoids both the sensational and the pedantic. He introduces technical words throughout the text and generally defines them adequately for the extent to which he uses them. The discussion makes no reference by name to "schools" or to professional debates on psychological issues; the description of principle is eclectic and frankly admits to a number of unsolved problems. The inclusion of numerous simple experiments which the reader is enjoined to try maintains interest quite effectively.

The book will disappoint the general reader who is looking for another source to help him "psychoanalyze" himself. The scientific purist will be critical of the error in the Muller-Lyer illusion on page 117 and of numerous over-simplifications as, for example, the casual reference to dogs going "crazy" when faced with too difficult discriminations in a conditioning problem, and the comparison of this behavior to the behavior of certain human beings in difficult choice situations. The reviewer, however, welcomes this text as basically sound and as a refreshing variation from the "self-salesman" type of popular, applied psychology. In conjunction with such a reference as *Psychology for the Fighting Man*, where more social applications of psychology are made, this text should be widely useful in general education, either in the high school or junior college.

DALE B. HARRIS.

University of Minnesota.

JACOBI, JOLAN. The Psychology of Jung. New Haven: Yale University Press, 1943. Pp. xi+166.

This is the first formal "synopsis" of Jungian thought, introduced in a foreword by Jung; it is a translation of the 1939 German original. In spite of Jung's 105 German and 35 English titles (all listed in bibliography), his name has too long been suggestive, in American psychology, of merely an assortment of ideas: introvert-extrovert, character typology, word association tests, the "collective unconscious" and rebel psychoanalysis.

Freud has taken occasion to refer to Jung as one of his most brilliant students. While Jacobi's synthesis specifically ignores the relation of Jung's contributions to the course of psychoanalytic thought in general (x), she does present a concise gathering of "all essential points," his basic theoretical formulations and definitions, organized into a system—a system of psychotherapy "a way of healing (58)." The section on "Practical Application" constitutes over sixty per cent of the book. Such organization, primarily around the therapeutic process of Jungian analysis, proves to be an effective procedure for a sequential unfolding of his conceptual "layers of personality," as well as of his principles of interpretation. We are thus led thru the positive, curative stages, "the process of Individuation," to the concept of the *Self*. The doctrine of the Self contains the clues to Jung's basic philosophic orientation, as well as to his diversified and controversial writings on religion, mythology, and mysticism.

Psychoanalytic formulations have a curious way of losing their quality of empirical conviction for many, when too removed from the analytic process, the clinical data; both Jung and Jacobi warn: " . . . only he who has had the experience is in a position to comprehend . . . (120)." Unfortunately, little case material is included, perhaps for brevity's sake; however, there are 17 schematic diagrams which are quite helpful in illustrating the typologies and structures of personality as the discussion grows in complexity. These drawings do not, however, take us to the dynamic process of Individuation, which is described as the freeing of the Self to participate more freely in the "collective unconscious" while somehow managing everyday adjustments.

Jung's original contributions derive mostly from the "transcendant, higher plane" of "psyche integrated into the Self (127)." He finds structural parallels in the Mandalas (Oriental symbolic representations), in Yoga forms, in Jesuit exercises, in Buddhist rituals, in the philosophy of Medieval Alchemy; and he finally makes a psychotherapeutic appeal to faith and to the irrational. The "highest task" of "Self-realization" is achieved when "the meaning of life no longer lies in the ego (143)." This philosophic orientation may explain the almost total disregard for the dynamics of personality development in the stages prior to "Self-realization"; Jung apparently is not interested in the developmental parallels of modes of adjustment in infancy, childhood, adolescence, or early adulthood. He evades the problem of individual differences in motivation, personality types, and styles of adjustment; his terms for the source of these differences are: "constitutionally destined," "naturally given," "born." Jung's hypotheses on heredity and development are scientific sorespots today. Jacobi's presentation allows these theoretical weaknesses to stand out in relief.

What is thus clear from Jacobi's "synthetic" formulations is the deviational character of Jungian ideas, from the body of psychoanalytic thinking, especially for the problems of emotional growth. He is not a competitor to Freud; his specialization is with certain phenomena more readily related to the somewhat more approachable concepts of *sublimation*, *superego*, and to certain Gestalt and Neo-platonic formulations about basic structural principles within everyday realities. Jung's social philosophy takes off from his criticism of mundane, egotistic, over-rational civilization and leads to a dangerously undemocratic dismissal of the body politic: "for the masses are blind beasts (144)." His social psychology is particularly problematic, on methodological grounds alone. But Jacobi's report is intended as a sympathetic synthesis; hence she avoids dispute and controversy.

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NOTES AND NEWS

Walter Taylor Marvin succumbed to a heart attack, May 26, at the age of seventy-two years. Dr. Marvin had served as assistant in philosophy, Columbia University (1898–99); as instructor and assistant professor of philosophy and psychology, Western Reserve University (1899–1905); as assistant professor of psychology and philosophy, Princeton University (1905–10); and as professor of psychology and philosophy (since 1910), dean of the faculty (1921–25), and dean of the College of Arts and Sciences (since 1925) of Rutgers University.

Columbia University has announced the promotion of Henry E. Garrett, professor of psychology, to the headship of the department of psychology.

A. S. Raubenheimer, dean of the College of Arts and Sciences, University of Southern California, was elected president of the Western College Association at the spring meeting, May 6.

Joseph Miller, director of guidance of the Wilkes-Barre Public schools has been appointed director of the Child Study Institute connected with the Juvenile Court of Toledo, Ohio.

S. Stansfeld Sargent has been promoted from an instructorship to an assistant professorship in psychology at Columbia University.

F. A. Fredenburgh has been appointed personnel director of Gimbel Brothers (Philadelphia), one of the largest department stores in the country. Dr. Fredenburgh was formerly advisor of men, College of the City of New York (N. Y.).

Lucien Warner, formerly with the Office of War Information, has joined the Marketing Research Department of *Life* Magazine as associate director of research.

Francis W. Hibler has resigned as associate professor of psychology at Illinois State Normal University, to accept a position as consulting psychologist with the firm of Stevens, Jordan and Harrison, Management Engineers.

Theodore R. Sarbin has resigned his position as director of education and research at the Lincoln State School and Colony (Lincoln, Ill.) to devote his full time to private practice, with an office at 55 E. Washington Street, Chicago.

Milton A. Saffir announces the removal of the offices of the Psychological Guidance Center, of which he is director, to the Pittsfield Building, 55 E. Washington Street, Chicago. This Center provides psychological services for aptitude testing and vocational guidance, for psychometric examinations, for psychological service to schools, and for counselling on the psychological problems of children, parents, young people, and adults.

Walter R. Miles, professor of psychology at Yale University, at a meeting on April 20 of the Iowa State College Chapter of the Society of Sigma Xi, gave a lecture entitled "Psychology and Military Aviation." He gave a similar lecture on April 20 before the Chicago Psychological Club, meeting at Northwestern University.

William E. Blatz, professor of child psychology and director of the Institute of Child Study, University of Toronto, has been appointed guest professor at the Iowa State College of Agriculture and Mechanic Arts (Ames) for the period, June 26–July 14.

Wilbert Scott Ray, professor of psychology, Hillsdale (Mich.) College, was recently appointed chairman of the department of psychology, Adelphi College, Garden City, N. Y.

MARY B. EYRE, professor of psychology, Scripps College (Claremont, Calif.), will retire, July 1, after thirteen years as head of the division of psychology. Miss Eyre will continue to give a course in psychology and child growth and development at Claremont Colleges, the graduate school of the associated colleges.

The 1944 edition of the Bibliography of Morale, compiled by BENJAMIN CHUBAK, which was published last year by the War Service Committee of the SPSSI at Harvard University, is now available. It lists books and periodical articles which have appeared in scholarly and popular journals on the subject of Morale and Military psychology for the years 1937–1943. Many items are annotated. An index is provided for ready reference. Copies may be obtained at $1.00 by writing to the compiler, Benjamin Chubak, at 5–76th Street, North Bergen, New Jersey.

On May 13, the University of Kentucky sponsored a Conference on Industrial Psychology at the Lafayette Hotel in Lexington. The conference topics dealt with the selection and training of young men and women for positions in industrial psychology. Participating were a number of personnel officers and executive officers of industrial and business plants. Many of the leading manufacturers and business men of the state attended. HENRY BEAUMONT, associate professor of psychology, was instrumental in arranging the conference. Persons interested in the conference or the recent training program in industrial psychology established in the University of Kentucky, may obtain information by writing to him.

The Board of Higher Education of New York City has authorized the Department of Psychology of The City College to offer graduate work. A committee of the department has set up a plan for conferring the M.A. degree, emphasizing individual work under staff guidance rather than the addition of graduate courses. Laboratory and field research, a thesis for each major research project, and preparation for a comprehensive examination will constitute important phases of the year's work. Candidates should apply to Professor J. G. PEATMAN, Secretary of the Committee on Graduate Work, Department of Psychology.

Encyclopedia of Psychology. The Philosophical Library announces the sponsorship of an encyclopedia of psychology to be published in about a year. The volume will be designed as a library reference book, and the articles will be written to the level of advanced students. The editor invites suggestions which will be helpful in making a scholarly, worth-while addition to the science of psychology. Correspondence should be addressed to PHILIP LAWRENCE HARRIMAN, Department of Psychology, Bucknell University, Lewisburg, Pennsylvania.

Examination for School Psychologist. The Board of Examiners of the Board of Education, Brooklyn, New York, announces examinations for a School Psychologist, open to either men or women who have a Bachelor's degree and in addition 30 semester hours in approved graduate courses; the total preparation, both undergraduate and graduate, to include a minimum of 52 semester hours in approved courses for training as School Psychologist. The experience requirement is two years of experience as psychologist in an approved organization or clinic for the study and treatment of mental disabilities and learning difficulties of children. Applicants shall be at least 21 years of age by February 1, 1945, and shall not have passed their 41st birthday on the date of the official announcement of the examination, which is June 15th. The initial salary is $2148 per annum which rises with 13 annual increments to a maximum of $4104. All preparation and experience requirements must be made by February 1, 1945. The examination will include a written test, an interview and personality test, a health examination and probably a performance test. Inquires should be addressed to the *Committee on Child Guidance Bureau Licenses, Board of Examiners, 110 Livingston Street, Brooklyn 2, N. Y.*

Resolutions of the New York State Association for Applied Psychology. With respect to the proposed reorganization of the APA and the attendant dissolution of the AAAP, the Executive Committee of the New York State Association for Applied Psychology unanimously approved the following resolutions at a meeting on May 19, which have been transmitted by GLADYS TALLMAN, the *Secretary:*

1. Postponement of final decision on the proposed merger is recommended until there has been opportunity for the full membership of area organizations and the APA and the AAAP to meet and consider the desirability and implications of the plan. This will be impossible so long as many members are in the Armed Forces and there are war-time restrictions on travel.

2. The need is recognized not only for the war emergency, but also for the post-war period, of a central clearing house and *Office of Psychological Personnel* to function for existing psychological societies, whether or not the proposed merger is eventually approved. The maintenance of such a central office has been one of the chief arguments advanced by advocates of the merger. There is no question but that such an office needs to be continued. Until, when and if, the merger takes place, a central office could continue to be financially supported by the national organizations, with the responsibility for its functions and personnel being delegated to a joint committee composed of members representing existing national organizations.

3. The importance of *direct representation* of affiliate organizations on the proposed Council of Representatives is reaffirmed and we recommend that the question of possible discrimination against existing affiliate organizations with less than 50 members be definitely removed; we urge their representation, provided qualitative conditions of membership are satisfied. Furthermore, we emphasize that the present and future functions of the present Board of Affiliates of the AAAP could be satisfactorily exercised by a standing committee of the Council of Representatives of the proposed national organization, with the committee's membership composed of the representatives from affiliated societies.

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CLINICAL PSYCHOLOGY IN THE MILITARY SERVICES

Edited by
ROBERT R. SEARS*

CONTENTS

CLINICAL PSYCHOLOGY IN THE MILITARY SERVICES, by *Robert R. Sears* . . 502
CLINICAL PSYCHOLOGY IN ARMY HOSPITALS, by *Morton A. Seidenfeld* 510
RECONDITIONING PROGRAM: ARMY GENERAL HOSPITALS, by *James W. Layman* 515
AN ARMY EXPERIMENT IN RETRAINING PSYCHONEUROTIC CASUALTIES, by *Staff, Classification Section, Classification and Replacement Branch, The Adjutant General's Office* 519
THE PERSONNEL CONSULTANT IN AN ARMY REHABILITATION CENTER, by *Stanley Lipkin* 524
THE NEW ARMY INDIVIDUAL TEST OF GENERAL MENTAL ABILITY, by *Staff, Personnel Research Section, Classification and Replacement Branch, The Adjutant General's Office* 532
SOME TESTING NEEDS IN MILITARY CLINICAL PSYCHOLOGY, by *Richard Wallen* 539
THE CLINICAL PSYCHOLOGIST IN AN AAF MENTAL HYGIENE UNIT, by *Max Deutscher* 543
AAF CONVALESCENT-REHABILITATION PROGRAM, by *Robert D. Gillman and Glenn V. Ramsey* 548
CLINICAL RESEARCH IN THE AVIATION PSYCHOLOGY PROGRAM OF THE ARMY AIR FORCES, by *Donald E. Super* 551
THE PSYCHOLOGIST IN THE PSYCHIATRIC PROGRAM AT THE NAVAL TRAINING STATIONS, by *William A. Hunt* 557
THE CLINICAL PSYCHOLOGIST IN A NAVAL HOSPITAL by *Mildred B. Mitchell* 561
PSYCHOLOGIST IN THE NAVAL HOSPITAL, by *T. W. Richards* 565
PSYCHOLOGICAL ACTIVITIES AT THE UNITED STATES COAST GUARD ACADEMY, by *Joseph M. Bobbit and Sidney H. Newman* 568

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* Dr. Sears, Director of the Iowa Child Welfare Research Station, was made a consultant to the Office of Psychological Personnel in May, 1944, in order to carry out a special study of clinical psychology in the military services. As part of this project he has planned and edited the symposium here presented—Editor.

CLINICAL PSYCHOLOGY IN THE MILITARY SERVICES

ROBERT R. SEARS

Consultant, Office of Psychological Personnel

The work of clinical psychologists has not been organized under any single administrative division in the military services. Problems requiring such specialized skills have arisen in many places, and individual clinicians have been assigned where they were needed. As a result, members of the profession are scattered throughout the services, and few of them, to say nothing of their civilian colleagues, have had very adequate conception of the role that clinical psychological work has played in the military organization so far.

In spite of the administrative decentralization, individual clinicians have done some extremely effective work. Ample testimony to this comes from the establishment of clinical psychologists as integral parts in the important new programs described by Seidenfeld and by Gillman and Ramsey in the papers that follow.

In order to bring together this work, that its scope might be more apparent to both civilian and military clinicians, a survey of the various assignments was made in July 1944. Information was obtained from three sources: published reports in the various technical journals, material on file in the Office of Psychological Personnel, and consultations with various administrative agencies in Washington. Undoubtedly many interesting programs were missed, but the over-all picture of the services given below probably covers the numerically most significant types of assignment as of July 30, 1944. Post-war historians will doubtless uncover many clinics, prisons, semi-experimental programs, hospital and rehabilitation activities that are not represented. Indeed, a full description of all the clinical work in the services would require a separate report from almost every active clinician.

Much of the work is being done under somewhat ambiguous titles, however, and one might easily get the impression that clinical psychology is not being widely practiced. The present series of reports shows how mistaken this notion is. It is hoped, too, that it will provide practical data from which post-war planning for the profession can draw suggestions as to services that can effectively be rendered by clinical psychology.

The job descriptions that are presented in the papers that follow are simply samples of the work of clinical people. Since the reports themselves reveal the relative isolation in which most of their authors have worked, the present paper will give below a brief survey of the three main service branches (Navy, Army Ground and Service Forces, Army

Air Forces) in an attempt to provide a more comprehensive setting for the individual papers.

One difficulty encountered in this survey has been that of deciding just what is clinical psychology. For example, the work of classification and personnel specialists has varied from creating group tests to the interpretation of test scores through detailed interviews with the men who take them. Clinical psychology is commonly understood to be a specialty in which individual persons are examined for diagnostic or therapeutic purposes, and in which the primary aim is to be of assistance to the patient or client himself. Logically, perhaps, some classification procedures could be brought under these criteria, but actually this work is organized in immediate connection with the larger program of occupational placement and it is questionable whether the *purposes* of the procedures could be related as much to the welfare of the individual as to the efficiency of the military services. A similar exception could be made with the diagnostic work in Naval Training Stations, but in such instances the actual procedures are so similar to clinical diagnostic work in civil life, and the skills required are so definitely those of the trained clinical psychologist, that it would be false to ignore them as a part of the total picture. There is no solution to this difficulty—in military life any more than in civil life—and no hard and fast criteria have been used in the selection of the jobs to be described. In general, these papers cover job descriptions, research programs and technical problems that relate to diagnosis of disturbed or maladjusted persons, reclassification of men for whom the standardized group techniques have been insufficient, and reeducative or therapeutic procedures.

The kinds of problems that arise in the military services are not dissimilar in many respects to those of civilian practice, although the age and sex characteristics of the population place emphasis on some types of disturbance and there is an infrequent occurrence of other types. The conditions of military organization, however, lead to greater specialization in practice for many clinicians. Those at Special Training Units deal largely with intellectually low grade personnel, for example, while others who are attached to general hospitals may see a fairly typical run of cases comparable to those of a civilian hospital. The enormous populations involved require special modifications in clinical procedure, as Wallen emphasizes in his paper. The necessity for speed in both testing and interviewing has been driven home by one published report after another. Not only the size of case load, but the fact that each case is a man whose primary job is to perform his military duties, demands that time allocated to each case must be reduced to an utmost minimum. Likewise, the aim of psychological work is often different from that of civilian practice. In the services, the main task is one of making the *group* operate effectively as *quickly* as possible and with the *largest num-*

ber of people. The individual's civilian aims and motives give way to his efficient performance of military duties as the principal frame of reference within which his welfare is sought, and the disposition of cases is planned on a different basis from that used in civilian life.

In addition to diagnostic and reclassification duties, clinicians are allocated to educational and reeducational procedures. This is particularly true for Personnel Consultants attached to a great variety of missions in different service commands. In the hospitals and redistribution centers clinical psychologists work under direct supervision of psychiatrists, and are frequently requested to assist in counseling and other therapeutic procedures. The amount of work of this nature is largely a function of the particular psychologist's experience and skill, and of the psychiatrist's need for assistance. Psychologists who are interested in reeducative therapy, and who are able to secure enough time free from their primary psychological duties, ordinarily find their psychiatric colleagues more than ready to assign them cases and to provide the necessary supervision.

NAVY

The work of clinical psychologists in the Navy is organized largely under the Neuropsychiatric Section of the Bureau of Medicine and Surgery. Properly trained people, both men and women, have been commissioned as H-V(S) and have been assigned to two main types of installation: Training Stations and General Hospitals. In each instance, the psychologist works both as an independent examiner and as a consultant to the psychiatrist. A number of detailed descriptions of the work at NTS have already been published, and these are reviewed by Hunt in the present series. No extensive report has been made before on the hospital work; two samples are given here by Mitchell and by Richards.

As of January 1, 1944, Louttit (36) reported 107 psychologists with commissions in H-V(S). Of these, 43 were engaged in what appears, from the record, to have been clinical psychology; the remainder were largely in the aviation psychology research program. By June 1 more than 50 were known to be doing clinical work. Detailed information on the location of installations was not available for security reasons.

The administrative arrangements in the Navy place clinical psychologists under the direction of a psychiatrist, both in selection and in operation. In any given post, the need for psychological assistance and a request for assignment are functions of the commanding officer, who is a medical man.

ARMY GROUND AND SERVICE FORCES

The situation is a little different in the Army Ground and Service Forces. Again there are two main classifications to be considered, one a job classification and the other a duty assignment. The Personnel Consultant is an officer in the Adjutant General's Department (AGD); he is attached to a headquarters command for whatever purposes the commanding officer may require. In many instances, the Personnel Consultant is a mature and effective clinical psychologist, and his duties are those which might normally be required of such a person in the particular command to which he has been attached. Reports of three of these jobs have been published previously in the *Bulletin*, one by Gilbert (**12**) on an assignment in an Army Training Center, one by Henderson (**16**) on the "Star" Unit, and three papers (**2, 38, 43**), have described the procedures used in a Special Training Center (for illiterates). Such officers have been used in Induction Centers also (**1**).

As larger numbers of casualties, particularly psychiatric, have been sent to hospital, the duties have changed somewhat. The process of reconditioning has now become of great importance, and Layman gives a description of some of the more recent problems in the present issue.

Until recently, the second place in which clinical psychologists were assigned was the Sanitary Corps of the Army Medical Corps. This is the branch of the Medical Department to which many non-medical specialists are assigned. During the last war, this was the chief place of assignment for clinical psychologists, and early in the present conflict a few men were commissioned there to serve in the Neuropsychiatric Units of General Hospitals. A preliminary report of their experiences was made by Layman (**25**) early in 1943. The work assigned to the psychologists was heterogeneous but fully in keeping with their training and with their commissioned status.

Because of increasing demand for clinical psychologists in medical installations, and the desirability of having direct technical supervision of the personnel by a clinical psychologist, a new program has been worked out in consultation between the Neuropsychiatry Division of the Surgeon General's Office (Col. W. C. Menninger) and the Classification and Replacement Branch of the Adjutant General's Office. This calls for the establishment of an Office of Chief Clinical Psychologist in the latter Branch; Lt. Col. M. A. Seidenfeld has been placed in charge of this Office, and he describes the new program in the present issue.

In addition to these two types of assignment, clinicians have been put into various kinds of work that bulk less large in numerical requirements but offer opportunity for extremely useful work. For example, time has finally become available for work on the preparation of individual tests, an area which in the early days of the war was of secondary importance to the development of group tests. A report on the new Army Individual Test of General Mental Ability is included in this issue.

Another program, semi-experimental in nature, in which a number of very able ASTP graduates were used, was that of the Developmental

Battalions. In this set-up groups of men were brought into camps for social psychological reconditioning or retraining. They were men whose morale had broken badly and who were in serious and immediate need of attention if they were to avoid becoming permanent casualties. This program was established on a trial basis, and a report of its procedure and results are given in the Staff report included in this present symposium.

Clinical psychologists are also attached to the Rehabilitation Centers of individual Service Commands. Here the clinical psychologist applies his skills in dealing with soldiers who have made such a poor adjustment to the military situation that they have been convicted by a general courts-martial and have been sent to these Centers in the hope that they may be made into useful members of the Armed Forces.

ARMY AIR FORCES

The principal clinical activities of psychologists in the Army Air Forces are in connection with Mental Hygiene Units, Personnel Distribution Centers, and the Convalescent and Rehabilitation Hospitals. The two latter programs are relatively new. Personnel Distribution Centers (formerly called Redistribution Centers) are designed for redistributing men who return to this country after the requisite number of combat missions. Lt. Col. Laurance Shaffer is in charge of the Psychological Section of this Command. There are a number of hospitals established for convalescence and rehabilitation of air force personnel. Psychologists have been assigned to each of these, on the request of commanding officers, for services as described in the accompanying paper by Gillman and Ramsey. Mental Hygiene Units are attached to various training installations, as is the case in other service branches. Their organization and duties have been described by Freedman (**9**, **10**), and the clinical psychological work in an AAF MHU is described in the current issue by Deutscher.

This brief description of the organization of clinical psychology in the services is far from complete, but it gives an over-all view of the areas in which clinical psychology is making its numerically largest contributions. As the war progresses, administration of the work is becoming somewhat more centralized in a few branches.

Changing war conditions will unquestionably alter the kinds of tasks to which clinicians are assigned. Rehabilitation and demobilization (separation) counseling will no doubt assume more important roles. As these changing emphases occur, and as the necessary administrative machinery is continuously modified, the problem of appropriate assignment for individual clinicians in the services will not lessen materially. As an intermediary agency, the Office of Psychological Personnel has rendered service in assisting this naturally difficult process, to the benefit of both the men and the services. Likewise, a number of psychologists in key positions themselves (e.g., Louttit, Jenkins, W. V. Bingham, Flanagan, Fitts, Limburg, Seidenfeld, and Shaffer) have been generous in providing information and recommendations to other branches and to the OPP. Without their efforts it is doubtful that the utilization of clinical psychologists would be as extensive as it is.

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CLINICAL PSYCHOLOGY IN ARMY HOSPITALS

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A forward step in the growth of modern science is discernible in the growing stature of clinical psychology within the Army. Evidence of this development during the war years may be found in the frequency with which articles relative to applications of clinical pyschology appear. A sampling from published reports, such as those of Bell and Altus (1), Heath (3), Layman (4), Seidenfeld (5) and the numerous reports made by the Staff, Personnel Research Section, should serve to convince the reader that clinical psychologists are making significant contributions to the War effort.

In the field, clinical psychologists working as Personnel Consultants have carried on individual consultation services in Induction Stations, Reception Centers, Replacement Training Centers, within Army Air Force installations, and Army Ground Force units. The contribution of clinical psychologists to Mental Hygiene Units of the Army has been stressed by Freedman (2), who states, "The military psychologist furnishes the psychiatrist and the military psychiatric social worker with data gained from measurements, utilizing intelligence, aptitude, achievement, and educational tests which combined with pertinent clinical observations, indicate the capacities and abilities a soldier may have."

From the start, the Division of Neuropsychiatry in The Surgeon General's Office bent every effort toward making full use of the psychologist in the medical program. Medical personnel have given clinical psychologists every opportunity to work as professional colleagues on the highest professional levels, providing optimal opportunities for them to deal with problems for which they are peculiarly qualified. The vision and understanding of such psychiatrists as Halloran, Menninger, and Farrell, working in the Office of The Surgeon General, as well as of many psychiatrists functioning in the field, have done much to clear the way for the present expanded program.

Only a relatively small portion of the published reports have dealt with psychological programs for military hospitals. In the past more attention has been given to the problems of personnel selection, training and aptitude testing, due to their important role in the initial phases of building a large military machine. With the attainment of this goal, more and more study has been given the maintenance of its smooth operation. Only after the onset of this secondary phase, however, do hospitalization, rehabilitation and correctional activities begin to attain their full degree of importance.

Actually, a number of psychologists have been engaged in clinical psychology in Army hospitals during the past two years. Many of the psychiatrists now serving in the Army had made use of clinical psychologists in civilian practice. The needs of the Armed Forces have served to draw them from the wards of great hospitals, from institutions caring for the mentally and physically ill, and the many clinics in which they have exercised their professional skills. It is not surprising, therefore, that extensive use of psychological services should be continued in the military hospitals. The contributions made by the few professional men who initially participated in the program have served to emphasize further the unique values which psychologists have to contribute to diagnosis, to proper in-hospital vocational training and guidance, and to correct duty assignment as influenced by medical factors. Military psychiatrists who are responsible for the Army's program are convinced that the psychologist is an essential member of the medical team required to return the psychiatric casualty to duty or to a useful civilian life. As a result, the clinical psychologist is on the verge of extending his activities into all the larger military hospitals in this country and overseas. This program is in its earliest stages and, as a result, cannot be presented in great detail at this time. However, a somewhat generalized picture of its scope is included here, so that professional psychologists may be able to maintain their perspective as to the role applied psychology is continuing to play in the military services.

SCOPE OF THE PROGRAM

It is contemplated that clinical psychological services will be offered in the neuropsychiatric sections of all named and numbered general hospitals and in station hospitals of one thousand or more beds. These clinical psychologists will include men already commissioned in The Adjutant General's Department, and some enlisted personnel assigned to the Medical Department (who may be commissioned at a later date into The Adjutant General's Department). It is not contemplated at the present time that the program will require the commissioning of psychologists direct from civil life.

The duties of these clinical psychologists will include the following activities, as directed by the chief of the neuropsychiatric division of the individual hospital:

a. Aid in the development and administration of a program of counseling for convalescent patients who are to return to military duties. In some instances this may be extended to include separation counseling for men leaving the service, when a specialist in Separation Classification is not on duty at the hospital.

b. Assist in the preparation of clinical records insofar as they pertain to the use and interpretation of special psychological tests required by the chief of the neuropsychiatric section.

c. Aid in the studies of special psychological problems relating to classification and retraining of neuropsychiatric casualties.

d. Assist medical personnel in determining the appropriate military occupational specialties of men designated as ready to return to duty, with particular emphasis on the selection of assignments compatible with the individual's physical and mental status.

e. To perform such other professional and administrative duties in the hospital, as will best assist the neuropsychiatrist in the accomplishment of the mission of proper management and disposition of patients.

Qualifications of Clinical Psychologists

As has been indicated above, clinical psychologists will be selected, for service in hospitals, from those already in the Army. It is unlikely that a necessity will occur for commissioning personnel directly from civilian life.

In general, these men will be selected from among officers and men capable of interpreting clinical findings in the light of total personality structure and who make use of this knowledge in diagnosis. The clinical judgment demonstrated in the approach to the interview and in the development of the complete psychological history is weighted heavily in determining men qualified for this type of duty. These principal requirements are augmented by the stipulation that evidence be presented relative to the clinician's background in clinical psychometry as applied to individuals and groups, with marked emphasis placed upon interpretation and evaluation of measures dealing with personality, special aptitudes and intellectual capacity.

Academically, a master's degree, with specialization in clinical, educational or industrial psychology, is required as a minimum standard. Exceptions will be made only when the individual is recognized professionally as an outstanding clinical psychologist.

A background of military experience is held to be desirable but may be weighted less heavily when the professional background justifies such action.

Administration of the Hospital Program

The utilization of clinical psychologists, who are under the jurisdiction of The Adjutant General's Department, in a program which is basically under the control of the Medical Corps, is an interesting example of interservice cooperation. To secure the smooth running of this plan, every effort has been made to select key administrative personnel who are at home in both branches of the Army.

A Chief Clinical Psychologist with the necessary number of assistants has been appointed. The office of the Chief Clinical Psychologist operates at the level of a technical advisor to the Chief, Classification and Replacement Branch, Adjutant General's Office. In this capacity, the Chief Clinical Psychologist is in a position to advise the Chief of this branch on all matters relative to the use of psychologists in this program. Functioning in this capacity, he likewise has a direct advisory relationship to the Director, Neuropsychiatry Division of The Surgeon General's Office. Thus, all matters dealing with the administration of the program are cleared through a single responsible officer.

Conferences are held frequently between the Chief Clinical Psychologist and the staffs of the respective Chiefs of The Adjutant General's Office and The Surgeon General's Office. All problems are thus adjusted so that the program evolved serves the needs of the hospitals and their patients.

In the administration of the individual hospital programs, the Commanding officer of each hospital exercises control through the neuropsychiatric consultant on his staff. Central control is not attempted but suggestions and recommendations for the most effective use of clinical psychologists are made from the Office of the Chief Clinical Psychologist

It is important that an appreciation be had of the highly cooperative relationship that exists in this project, for it represents to the best of the writer's knowledge, the largest single organizational program that has ever been established in which the psychologist is a collaborator in a psychiatric program. This symbiotic program depends upon a clear-cut recognition on the part of both The Adjutant General's Office and The Surgeon General's Office, that there are services which the psychologist trained in hospital practice can render more effectively than the physician, the social worker or any other category of professional.

TRAINING OF PROFESSIONAL PERSONNEL

The training of psychological personnel who are to engage in the hospital program is a matter of the utmost importance, in view of the rather limited numbers of psychologists who have actually had successful experience in this phase of applied psychology. The need for men who are qualified to carry on this work in the hospital wards is considerably in excess of the officer and enlisted psychologists who can be made available for this type of assignment. Many who will be assigned are therefore in need of a type of orientation to this field of endeavor. In general, they will have had excellent academic training but will be lacking in the experience of working with the mentally ill.

The selection of men for training will be based on knowledge of test administration and interpretation, stability of personality, and indications of adaptability to the hospital program. A training program will be provided which will be of sufficient length to insure proper orientation to the job and the securing of acquaintance with the basic techniques and practices to be used.

Further training under close supervision will be continued while the men are on hospital assignment. Frequent inspections by neuropsychiatrists of the staff of the hospital and of the Service Command will insure that standards of professional efficiency are maintained. The assistance of the Director, Neuropsychiatry Division of The Surgeon General's Office, and the Chief Clinical Psychologist of The Adjutant General's Office, will be utilized in this program as required by the hospitals and the Service Commands concerned.

A more formal description of the training procedures will be presented at a later date when the program has been completely established.

SUMMARY

A program of clinical psychological service in all general hospitals and in the major station hospitals is now being established. This program is operated by the Classification and Replacement Branch of The Adjutant General's Office under the jurisdiction of the Neuropsychiatry Division of The Surgeon General's Office. Responsibility for supervision and direction of the program rests with the Chief Clinical Psychologist, Adjutant General's Office, who is at present engaged in preparing a training plan and a personnel procurement program designed to supply the needs of the Army for clinical psychologists in hospitals.

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RECONDITIONING PROGRAM: ARMY GENERAL HOSPITALS*

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The Reconditioning Program, Army General Hospitals, was originally initiated in 1943 when classification of patients according to seriousness of the illness or injury, and a program of physical activity which paralleled the treatment was developed. That is, evidence had accumulated which showed that patients undergoing long periods of treatment lost the physical fitness acquired during periods of training. For instance, a patient with a joint condition requiring treatment in a cast tended to deteriorate physically through failure to keep the rest of the body in good condition. This loss necessitated physical retraining in order to acquire the flexibility, endurance, agility and coordination basic to a fighting condition.

Subsequently, it became recognized that morale, "fighting" mood and other psychological factors were also lost because of removal from units undergoing active training, discouragement over time in hospital and separation from friends. Similarly, it was also recognized that certain patients, following treatment and recovery, would require reclassification and, possibly, retraining in order to perform military duty. That is, to reclassify and retrain those with residual defects who could no longer perform the duties for which they had been trained originally. This was particularly true for the battle-wounded casualty, including those who would return to a changed duty status as well as those who would be separated from the military service.

In order to coordinate these and other responsibilities subsumed under the Program, a directive was issued in March 1944. This brought the activities under unified direction and provided a definite table of organization and skills requisite to the mission.

Patients are now classified into four principal groups, according to the current medical and/or physical condition. These are:

a. Class IV. Those recovering from prolonged illness, serious injury, or surgery, and comprising bed patients.

b. Class III. Those recently ambulatory and those whose ward or clinic treatment will extend over relatively long periods of time.

c. Class II. Those capable of more extensive and intensive physical activity but still requiring treatment and/or observation by the medical officer.

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* The writer wishes to acknowledge his appreciation to Colonel L. R. Poust, M. C., Commanding Officer, Hammond General Hospital, for permission to prepare this article and his constructive guidance to the writer in directing the Program at this hospital.

d. Class I. Those in the final "hardening" process who will return to duty in a relatively short time.

However, for purposes of the Reconditioning Program, patients may be grouped into two major categories: (1) hospitalized for relatively prolonged periods (90 days or more), and (2) short term hospital treatment (less than 90 days). Division into these two groups allows for more intelligent direction and planning of the objectives to be described. These are:

1. *Physical.* Depending on the medical and physical condition of the patient, the intent is to initiate a maintenance type of calisthenics which gradually increases to those of a more definitely hardening nature. To illustrate: a patient may have undergone surgery which requires prolonged bed care or a cast over a repaired extremity. Such patients tend to become "soft" while awaiting full recovery. However, carefully planned calisthenics can keep the rest of the body in good muscular tone. During this period, the specifically injured part may also undergo physio and hydrotherapy. As rapidly as the medical officer prescribes, the nature, extent and intensity of the calisthenics are increased so that upon discharge from the hospital, the patient is physically ready either for military duty or for civil life, as may be the case.

2. *Education.* This activity has two major phases: (a) those of an academic or occupational nature, and (b) those designed to keep the patient intelligently informed as to background causes for the war, its progress, and his responsibilities with reference to our military objectives.

This and the reclassification program are of particular interest to the professional psychologist, since it is in these that his skills and training are of greatest value. In general, the educational objectives are emphasized most strongly for the patient who will require prolonged care and whose final physical status will require new civil or army occupational pursuits upon completion of the medical treatment. However, the short term group, particularly those whose educational careers were interrupted upon induction, are also encouraged to utilize the same facilities.

The Army, through the United States Armed Forces Institute, has developed an extensive correspondence and self study educational program. Approximately 750 courses are offered, ranging from about the seventh grade to college and post-graduate levels. The content is extensive and includes the usual academic as well as vocational and semivocational subjects.

The intent is to encourage the patient to take advantage of these educational activities. The educational officer, frequently a psychologist, acts in the usual guidance capacity and assists the patient to select subjects for study in terms of ability levels, previous education, aptitudes, skills, future educational and vocational interests. With the permanently handicapped, the guidance also takes that factor into consideration.

The second phase of the educational activities has been officially designated as "orientation-information." Its intent is not to indoctrinate or propagandize, but rather to develop opportunities whereby the soldier will be stimulated to think through, and more intelligently understand, our own national growth, institutions, ideals and customs. In addition, it intends to provide him with an intelligent understanding of our allies as well as the objectives and traditions of the enemy. In essence, the programs resemble a "town hall" meeting and are frequently led by the soldiers themselves. Directives require that the leader avoid dogmatic and personal opinions. Points raised by the participants are summarized objectively and without reference to social, economic, political, or other implications.

3. *Occupational therapy.* Historically, this profession developed as an aid in the treatment of the mentally and physically ill. Originally, it was intended to provide a diversional and interest factor in the treatment of these patients. It was eventually expanded for its therapeutic value to other types of patients and even to include occupational activities where such are indicated. That is, activities such as loom weaving, leather-craft and metal work are used to restore muscles and joints which have undergone injury with subsequent surgical treatment. Others, such as printing and carpentry, can be used both for the corrective value as well as for the vocational possibilities. These can be graded to coincide with the degree or type of movement or coordination which presently exists and gradually expanded as the basic physiological factor warrants.

4. *Classification.* Very recently the Army has introduced a physiological and physical scheme of classification, or a "physical profile." This profile affords a functional estimate of the various organs, systems and integral parts of the body as they relate to performance of military duty. Obviously, the Medical Officer is responsible for this phase of classification. However, a method is now provided whereby the Medical and Classification Officer can jointly determine the military (or civilian, when indicated) occupational assignment which the soldier is qualified to perform. That is, the Classification Officer determines the general ability, aptitudes and skills as they relate to the potential assignments the soldier is qualified to fill. These are evaluated in terms of the profile and its relationship to the potential assignments. Final assignment is then made in terms of the physical demands of the job, the profile, intelligence, skills and aptitudes.

In summary, the Reconditioning Program embraces calisthenics, education-orientation information, occupational activities both as therapeutic aids and as they relate to prevocational planning, and classification and reclassification as determined both by the over-all and specific physical conditions and the intelligence, aptitude and skills required. The medical staff maintains responsibility and control to insure that all activities relate themselves to the medical and physical status of the patient. Actual supervision and accomplishment of specific missions is the responsibility of specialists working in collaboration with the medical staff. Emphasis on each mission is determined by such factors as: current medical and physical status of the patient, required length of hospital care, and ultimate disposition with reference to military duty or return to civil life.

AN ARMY EXPERIMENT IN RETRAINING PSYCHONEUROTIC CASUALTIES

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I. INTRODUCTION

Faced with a diminution of supply, the necessity for the conservation of such manpower as was available for military service has led to a number of investigations of possible methods of utilizing personnel in categories which have formerly been considered unusable. One such study is the Army's recent experiment in the retraining of a group of soldiers recovering from psychoneurotic disorders.

Previous experience has shown that the so-called reactive syndromes or situational neuroses are not of a malignant or deep-seated character. They respond favorably in a large measure to environmental rearrangement or social treatment. While many of these individuals have thresholds which make their placement in areas other than the zone of interior questionable, others show what appear to be complete recoveries. Many of these men possess skills which are of value to the Army and many others are capable of absorbing training for new military duties. To determine the feasibility of retraining recovered psychoneurotics, the Army undertook an experimental program which resulted in the saving for military service of a majority of the soldiers who participated in the program and who might otherwise have been discharged from the Army.

II. CLASSIFICATION AND ASSIGNMENT

The initial procedure in this experiment consisted of the classification screening of a group of soldiers most of whom were hospitalized personnel with neurotic illness from both overseas and continental organizations. The purpose of this type of screening was to determine emotional, physical, and occupational suitability for retraining and to allocate personnel thus being classified to the appropriate training centers where, under a modified training program, the rehabilitation of these men could continue.

The classification and assignment of a soldier, in this experiment, resulted from the combined judgments of psychiatrists and psychologists. Each soldier was first interviewed by a neuropsychiatrist and his findings and recommendations were made available to the personnel consultant (psychologist) and classification officer. The neuropsychiatrist, during the interview, had before him, in addition to the man, the Service Record and the Soldier's Qualification Card. These records contained a summary of the pertinent civilian and military accomplishments of the soldier (education, work experience, test results, military training, etc.), as well as a concise report of his military history. In addition to these basic records, there was available to the psychiatrist a clinical report from the hospital.

The psychiatric interview was followed by one conducted by two enlisted men, specialists in personnel psychology. This team carefully reviewed the findings of the neuropsychiatrist; Army General Classification Test score, aptitude, trade, and other test scores; civilian and military educational and vocational experiences; hobbies and interests of the soldier; and information concerning type and particular requirements of jobs available for which training could be provided at selected training centers. The information obtained through this interview became the basis for the interview-team's recommendations for one or more possible occupations. Further, a list of facts considered important to the continued readjustment of the soldier was prepared for use at the training centers.

The assignment of the men was accomplished after a full review of the observations from the previous interviews. Two officers (psychologists) functioning as an assignment board, in conference with the soldier, made the final recommendation as to the occupational assignment for the soldier. As a general working rule in recommending an assignment, emphasis was placed on the soldier's desires, needs and qualifications, as modified by his emotional and physical condition. However, new assignments resulted from the careful analysis of all the available information concerning each man.

Since therapy was a major factor in making an occupational recommendation, it was necessary in many instances to compromise minimum standards for entering an occupation. It is not surprising, therefore, that a large per cent of the soldiers were recommended for assignment to jobs on a higher level than that of their civilian jobs; likewise, some men were recommended for assignment to jobs on a lower level than their civilian jobs. In general, soldiers were given job assignments commensurate with their potential and acquired skills, as well as on the basis of opportunity for occupational advancement.

The success of this experiment was and is contingent upon the results of the training program at the three training centers, Fort Belvoir, Aberdeen Proving Ground, and Camp Lee. It was necessary, therefore, to devise experimental assignment techniques to fit the distribution of ability as evidenced by test scores, of age, and of neuropsychiatric ailments, in order that no one training center would be at an initial disadvantage when compared with either or both of the other training units. Since Aberdeen offered jobs which were predominantly more technical in nature than those at either Belvoir or Lee, the men assigned for ordnance training were of slightly higher calibre with respect to scores on the Army General Classification Test. In general, the distribution of age groupings and types of diagnoses was the same to each of the training centers.

The problem of numerical distribution was rendered more complex than was anticipated by the policy of granting some of the enlisted men almost complete freedom of choice, sometimes both in job and locality. Considerable importance was attached to the matter of individual assignment as a means of active therapy. In a program of this kind, assignment must necessarily be largely personal. Numerical distribution must be subordinated to individual placement. Any other approach to the problem would serve only to aggravate psychoneurotic difficulties and to weaken the therapeutic value of rehabilitation. A returned overseas soldier who reacts violently to noises obviously could not be assigned to Aberdeen in any capacity; a soldier with organic difficulties in addition to his psychoneurosis could not be assigned to Belvoir for engineer training of a heavy manual nature. The recommendations of the psychiatrists as to locality of assignment were followed closely, and any man who had an intense desire for a particular training center was assigned accordingly.

III. TRAINING

The Developmental Training Units at each camp were organized independently of each other and procedures were varied in accordance with existing physical and administrative dictates. The primary objectives of these units were:

1. To originate and test policies upon which future similar projects could be established;
2. To originate and test procedures by which tested policies could be adequately implemented in Army Regulations; and
3. To originate and test criteria to be used in evaluating the effectiveness of such a training program.

Secondary objectives of this experiment were to effect the return of convalesced soldiers to a full duty status or to separate those soldiers who could no longer perform military duties. Since it is not possible here to consider the detailed programs of each of the Developmental Training Units, only a brief description of operating procedures of the unit at Aberdeen Proving Ground is given.

Experience early indicated that a number of administrative problems required attention before the retraining of these soldiers for specific jobs could be undertaken. The pay, furlough, and supply problems were quite real to these soldiers. Arrangements were made to have partial payments of back pay given to all men; necessary clothing and supplies were issued; and a lenient policy was formulated by which a short emergency or convalescent furlough was granted to all who were in need of them. The morale of these soldiers had been so conditioned by previous failure to appreciate the necessity of accomplishing these details that, upon arrival at the training center, the men were in no mood to discuss or embark upon job training. Modified garrison living, as initially followed, gradually emerged into full garrison type of living after approximately five weeks.

Specific training assignments to courses available under existing training doctrine at the center required that a careful analysis be made of the various recommendations which had previously been made for each soldier. A further problem was presented by the fact that many of the courses which were available at this center were being taught at a level which presumed special qualifications not ordinarily required for such occupational specialities in the Army as a whole. This problem was solved by inaugurating "on the job," or understudy, training assignments for a large proportion of the soldiers assigned to Aberdeen. By means of this procedure, it was possible to provide for the continued convalescence of the trainees through rest, recreation, psychotherapeutic interviews, and intensive psychological and vocational guidance sessions, and at the same time to make available a type of training more in line with the previous training experience of these soldiers. At the inception of the program, one half of each day was devoted to technical training and the other half day to physical rehabilitation and group recreation. It soon became apparent, however, that the men preferred to spend longer periods in the pursuit of their training assignments.This resulted in a modification of the program to provide a full day of training each day except for two afternoons a week which were devoted to physical rehabilitation and recreation. "On the job" training was provided in 34 specific duties, while training in technical schools covered 17 specific military jobs. Every trainee who was in need of special psychological assistance was given at least three complete interviews by a psychologist while many men were given as many as eight such interviews conducted on a full clinical basis.

Upon the completion of the technical training course, and after medical clearance, each man was declared available for placement. Men were reported available to the local center for placement in the military duty requiring the training completed or were reported available to the Adjutant General's Department for special local placement within the continental limits of the United States. In order to insure that judicious assignments would be made, the recommended assignment was entered upon the Qualification Card, and an abstract of the classification board proceedings, together with a copy of the psychiatric report, accompanied each Qualification Card for the man concerned.

IV. SUMMARY

The experimental training program, inaugurated at three replacement training centers, which undertook the retraining of a group of soldiers with psychoneuroses possessing a variety of symptoms, made available for assignment to specific military duties a majority of the men who entered the program. While there is evidence to support the belief that such a program will make available to the Army a source of manpower formerly considered unusable, a definite evaluation of the program must, however, be based upon the performance of these soldiers on the jobs to which they have been assigned. To make possible this evaluation of the program, organizations to which these men have been assigned are being required to report the manner of performance of each recovered psychoneurotic assigned to duty through this program. A final determination of the effectiveness of the experimental procedure must await the judgments of the organizations from whom these reports will come.

The experience gained during this experiment has served, however, to bring to clearer focus several factors which are of primary importance in effecting the recovery of the psychoneurotic soldiers. Among these factors are:

1. Insuring that the men are paid promptly, they that receive new clothing when it is required, and that adequate furlough privileges are made available, thus making it possible for the soldier to maintain his self-respect and to be assured of the Army's continued interest in him; and
2. Keeping the soldier busy doing a necessary job which is commensurate with his skills and abilities, thus assuring him that he is making a contribution to the Army's mission.

THE PERSONNEL CONSULTANT IN AN ARMY REHABILITATION CENTER

STANLEY LIPKIN

Second Lieut. A.G.D.

The work of the Personnel Consultant in Replacement Training Centers and Special Training Units has been reported in previous issues of this section of the *Bulletin*, but no description of the work in the Service Command Rehabilitation Center has been made. After a brief sketch of the mission, procedures and activities of a Service Command Rehabilitation Center, this paper will describe and discuss the nature of the duties of a Personnel Consultant and Classification Officer. The description will naturally be in terms of the personal experience of the writer, and is not necessarily representative of similar assignments in other Centers.

Rehabilitation Centers were established to prepare for return to duty, soldiers who manifested inadequate adjustment to army life by being convicted of a general courts-martial offense, although not all soldiers guilty of these offenses are sent to Rehabilitation Centers. The Rehabilitation Center receives and retains only those men who have not committed certain offenses (such as traitors, drug addicts, psychotics, perverts, murderers, arsonists, etc.) and who have been recommended for confinement therein and not at a Disciplinary Barracks. A soldier convicted and sent to a Disciplinary Barracks is a general prisoner, but at the Center he is considered a rehabilitee.

Preparation for returning to duty is accomplished by a three-fold program.

1. *Military training.* This includes the basic military subjects as well as the current army orientation program. Upon completion of this training, the rehabilitee is often militarily prepared for immediate overseas assignment, providing, of course, he is physically qualified for such duty.
2. *Educational activities.* For men who are illiterate or below fourth grade educational level there are classes where the tool subjects are taught. Those who have adequate proficiency in the tool subjects, study vocational subjects related to the military duties they may be required to perform upon restoration to duty. At present, the classes are conducted after training hours, and all rehabilitees are required to attend regularly the particular class they are assigned to by the officer in charge of evening school.
3. *Personnel adjustment.* A course in personnel adjustment is given to assist rehabilitees to orient themselves properly to military life.

Rehabilitees spend six or more months participating in this training. Their progress is reported on periodically by officers heading sections concerned with their training and behavior.* These reports are included in the case history worked up by the Department of Psychiatry and Sociology. At the appropriate time, this and other pertinent material is submitted to the Commandant and the restoration board.* They, after interview with the rehabilitees under consideration, independently recommend them as fully, partially, or not at all "ready for restoration."

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* The Personnel Consultant is excused from turning in reports so as not to prejudice his therapeutic relationship with the rehabilitees, and thus ineffectualize his program.

Men considered "ready" are sent to the Personnel Consultant who as classification officer fills out a data assignment sheet.† Approximately three weeks and three days before a recommended date for restoration, the data assignment sheet, the recommendations of the board and Commandant, plus the records used by them as basis for decision, are sent to the Commanding General of the Service Command who makes final disposition. Disposition may mean restoration, transfer to a Disciplinary Barracks, or continuance of stay at the Center in expectation of further change and development which will permit restoration to duty status.

ACTIVITIES OF THE PERSONNEL CONSULTANT

Personnel Adjustment. Personnel adjustment, one of the three phases of restoration preparation, is achieved through a program of group psychotherapy conducted by the Personnel Consultant with the aid of four trained enlisted men. Approaches and techniques employed are those common to all group psychotherapy, but are modified so as to be applicable to an army situation with subjects who in the main do not have gross personality disorders.

Because of administrative and therapeutic needs, the program is built around two types of groups—large and small. Rehabilitees attend both types of groups three times weekly on alternate days; thus they participate in a fifty minute class six days a week. There are four large groups, each with a membership of approximately 200 to 250 rehabilitees, and sixteen small groups, each with a membership of approximately 40 to 60 rehabilitees. The large groups are conducted by the Personnel Consultant, and the small groups by enlisted group therapists.

Large Groups. The environment of each large group is generally structured to permit freedom of speech and emotional expression so that rehabilitees in responding to the stimulation of the group situation will reveal their characteristic emotional and behavioral patterns. The group's freedom is limited at times for therapeutic and military purposes. The limiting factors are: 1. The Personnel Consultant, being an army officer, controls and limits the environment by his insistence that rehabilitees adhere to military procedure in the matter of being called upon or recognized in the group. 2. As a therapist conducting group therapy, he re-structures the environment to attain certain objectives. The strict observance of 1 will of course vary with the nature of 2.

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* The restoration board consists of three officers from the Center appointed by the Commandant.

† This sheet may be briefly described as a summation of the rehabilitee's civilian and military skills plus suggestions for recommended assignment based on analysis of such skills. It also contains the contemplated date for restoration.

Present at each meeting besides the Personnel Consultant is an enlisted group therapist. Present policy is to rotate this assignment, so that all the enlisted therapists will be kept up-to-date on each of the groups' levels of development.

The Therapeutic Process. To accomplish the objectives of the personnel adjustment program, mental hygiene concepts are discussed in terms of problems of adjustment peculiar to the army environment. The lecture is used for the initial explanation of the concepts. Since spontaneous opportunities to show inter-personal relationships as they exist, as they arise, and as they change in a life situation, often result from rehabilitee behavior, the lecture with its planned topic is frequently subtly abandoned and replaced by group psychotherapy which uses as legitimate material for group analysis and discussion all behavior manifested by the group or its members.

To illustrate: Let us say the topic for development and discussion in the large group is the frustration-aggression hypothesis. The Personnel Consultant develops this concept in language the men understand. When satisfied that they do understand, he asks members of the group for examples based on personal experiences. After examples are given, the group and the Personnnel Consultant analyze and relate them to growth, social and personal, understood and accepted by the group.

The various steps in this therapeutic process follow no set pattern since the sequence depends completely upon the objective of the particular meeting as well as the group's attained social, emotional, and informational levels. It is, however, always planned that at the end of the process, social and emotional learning based on experiences in the group will be correlated so that all parts of the learning experience will have their proper relationship to each other.

For contrast, let us examine a meeting where situational needs made for a sequence differing from the above cited example. Group behavior which was indicative of emotional immaturity and inadequate socialization came to the attention of the Personnel Consultant. At his next meeting with the group in question, the Personnel Consultant "started the ball rolling" with a discussion and analysis of this behavior by both himself and the group.

The totality of possible implications of this behavior, social and personal, were examined by the group in the light of an already developed "group psychotherapy universe of discourse." Those aspects of the behavior which were not readily explainable by concepts constituting this "group psychotherapy universe of discourse," were made meaningful by introduction on the part of the Personnel Consultant of hitherto undiscussed concepts. This brought to full awareness the underlying motivational forces of the behavior.

Before ending his consideration of this behavior, the Personnel Consultant contrasted the dynamics of this group's behavior with that of a group of soldiers in "good standing"; demonstrated thereby where the group's values were at variance with average values, and what changes of attitude and measures of growth, personal and social, would be necessary before their behavior would approximate the "norm."

The Small Groups. The environment of the small groups is structured for spontaneity and personalization to permit relation of learning resulting from large group interaction to specific problems of individuals. Personality tests are employed to organize four small groups of each large group so that men with somewhat similar levels of socialization and personality organization will be grouped together. There is, however, no rigidity about group membership and it is changed when it is therapeutically warranted.

Enlisted group therapists guiding and controlling the small groups hold frequent conferences with the Personnel Consultant to discuss specific problems confronting them in their groups. When they require more than verbal assistance, the Personnel Consultant, acting as a therapist, enters their groups and demonstrates the proper techniques and avenues of approach. As a Company Officer, he also enters the small groups to inspect their functioning. During the inspection he maintains a relationship with the rehabilitees similar to that of a Company Officer and not that of a therapist.

Confinement and Group Psychotherapy. Generally, confinement of some duration affects the uniqueness and spontaneity of the human personality and intensifies already present emotional conflicts and tensions. Group Psychotherapy has been prophylactic in preventing this condition from developing at the Center. Constructively, it has tended to develop socialized values and a better understanding of self and others on the part of the rehabilitee.

Specifically responsible in the Group Psychotherapy program is the practice of affording each rehabilitee an opportunity for self expression in a group composed of individuals with similar problems and the analysis of such expression by the group. The basis of this analysis is a universe of discourse consisting mainly of mental hygiene concepts but containing those concepts of the social sciences and of ethics which relate understanding of self and others to responsibility of self to others and society. This universe of discourse is acquired by rehabilitees through participation in the large group meetings.

As a consequence of confinement, a general prisoner may also tend to adopt an attitude toward authority which is unlike that of a soldier. Group psychotherapy seems to have arrested this, and instead, prepares the general prisoner for resumption of thinking and behaving towards authority like an enlisted man. The responsible factor is the division of large groups into small groups, for it enables the rehabilitee to participate in three dissimilar types of authoritative relationships; in the large group an "acting enlisted man to a psychologically oriented commissioned officer," who makes clear the need for authority and discipline and who discusses the factors underlying personal resentment and disobedience to authority; and in the small group of an "acting enlisted man to a non-commissioned officer." The third authoritative relationship, that of an "acting enlisted man" to a Company Officer, is a consequence of the Personnel Consultant's frequent inspections of the small groups. In this relationship the Personnel Consultant insists that rehabilitees behave in a manner typical of good soldiers.

Progress Reports. The flux of ideas, feelings and behavior manifested in the groups are recorded through daily progress reports, which are written up by all group therapists after each meeting. They contain a dynamic account of the group as regards its attitudinal, ideological and behavioral structure.

Changes in attitude and behavior on the part of individuals are also recorded. When these changes seem important, an abstract of the daily progress report is made and included in the rehabilitee's individual folder. The folder consists of an extract of certain items of the Service Record, Soldier's Qualification Card, and summaries of individual interviews. It also contains the rehabilitee's performance on personality tests which will be discussed in the next section.

The value of these reports is self evident. They enable the Personnel Consultant to measure the progress of groups and individuals as well as indicate to him when there is a need for change in group structuralization or individual rehabilitee change in particular small group membership.

Personality Testing. To assess objectively the results accruing from the personnel adjustment program as well as assist the program's functioning, the Personnel Consultant employs two well validated tests—The Minnesota Multiphasic Personality Inventory, and the Group Rorschach, as developed by M. R. Harrower-Erickson.

Each rehabilitee, on arrival, after a brief adjustment period is given both of these tests. Results of this first testing are utilized in two ways: 1. To structure the small group membership in terms of personality organization so it will be more effective as a therapeutic instrument.

2. At conferences, to acquaint the enlisted group therapists with the probable nature of the personality organization and difficulties of rehabilitees who will become members of their groups.

After sufficient exposure to the rehabilitation program, rehabilitees are retested to note whether the profiles on the Minnesota Multiphasic Personality Inventory, and the number of poor signs on Rorschach have changed. Changes are discussed at conferences between the Personnel Consultant and therapists. As a consequence, therapists are equipped factually to continue with the therapeutic process in a manner calculated to suit the particular level of development of the group and its members.

In the case of those whom the Commandant and the restoration board contemplate restoring, a third testing is administered as a means of checking the validity of the tests against the reports of officers close to the rehabilitees. It is believed that in this way objective standards in judging "restoration readiness" will be maintained, and possibly new objective factors uncovered as data accumulates.

The above is the procedure followed with those men considered literate for personality testing purposes. But from study of approximately 500 tests, it has been determined that rehabilitees below a certain critical AGCT (Army General Classification Test) score, and who have not attained sixth grade educational level, need a brief pre-test to ascertain whether or not they will need assistance in taking the tests. The pre-test used consists of the more difficult reading material from both personality tests. Should assistance be necessary, the special verbal testing techniques developed for such men is employed. This technique may be described as a form of paraphrasing in terms peculiar to a man's background and education.

In addition to the group personality tests described, the Wechsler Mental Ability Scale, Form "B," an individual intelligence test, is included as part of the battery of personality tests, for it samples personality traits and work habits, as well as gives a picture of mental functionings and intelligence level. It is used when requests for mental level or individual diagnoses are received from the Commandant or the Psychiatrist.

Classification Activities. The duty of Classification and Assignment Officer at the Center is discharged by the Personnel Consultant. In this capacity his main function is to suggest proper military work assignments for rehabilitees who have been recommended for restoration by the Administration.

Before suggesting an assignment the Classification Officer interviews each recommended rehabilitee to obtain a measure of his interests, abilities and work experience. He depends, however, mainly on two military forms to furnish the bulk of this information. These forms plus the interview and the personality tests previously discussed are the basis for his judgment.

The forms are the Soldier's Qualification Card, War Department, Adjutant General's Office, Form 20, and the Service Record, War Department, Adjutant General's Office, Form 24. They record chronologically all aspects of the rehabilitee's military history as well as contain those facts of civilian training pertinent for classification purposes. The Form 20 is of particular value for it contains a detailed picture of civilian and military work experience, schooling, learning ability, and special aptitudes.

Using this material, the Classification Officer makes up a Data Assignment Sheet for the Service Command, which may be described as a summarization of information already present on the Form 20 and in the Service Record. It does, however, contain three items which are not in these records: recommended assignment, special qualifications, and readiness for overseas duty. Before recording them, the Classification Officer analyzes each recommended rehabilitee's military and civilian history and decides in what capacities the rehabilitee would best serve the army—all factors considered. He also decides whether the rehabilitee is militarily prepared for overseas shipment now or will be ready in the near future. These decisions are not final, for the Service Command makes final disposition as to the particular organization and duty to which the rehabilitee will be assigned.

It can be seen that classification procedures followed at the Center are similar to those employed at all military installations. But since there is greatly increased information at the disposal of the Classification Officer, it is possible to suggest assignments which will consider more completely the "whole person," while keeping foremost the needs of the army.

Maintenance and completion of rehabilitee's Soldier's Qualification Cards, Form 20, is also the responsibility of the Personnel Consultant. In this connection, it is frequently necessary to initiate a new Soldier's Qualification Card, or complete an old one. Such completion often entails the administration of the AGCT and the MA (Mechanical Aptitude) test. These tests are not given daily like the personality tests. Procedure is to accumulate a sufficient number of tests so as to have the benefits of group testing.

MISCELLANEOUS DUTIES

Consultant to the Commandant and Company Officers. Because of his work in group psychotherapy and personality testing, the Personnel Consultant is in a position to sense the shifts in morale, attitudes, and feelings present in each rehabilitee group as well as to note gross or slight rehabilitee character and attitudinal changes. When these changes bear relationship to administration policies, objectives and problems, he brings them to the attention of the Commandant and those officers responsible for rehabilitee training and behavior.

These discussions are held routinely with the Commandant, and when necessary, with other officers, but they are not intended to give the Personnel Consultant's evaluation of individual rehabilitees. Their value stems primarily from the picture given officers of the Center of the difficulties attending efforts of rehabilitees to adjust certain aspects of their personality and attitudinal structures to socially acceptable norms.

Lately, a new phase of activity has been undertaken by the Personnel Consultant. This is the formulation and direction of a program of in-service training for guards and custodial personnel to control, understand, and evaluate the men under them.

SUMMARY

The principal duties of the writer as Personnel Consultant and Classification and Assignment Officer consist of:

1. Conducting a program of group psychotherapy to:
    a. Reduce emotional tensions present among the rehabilitees.
    b. Develop social and personal values more akin to those of the average soldier.
    c. Assist rehabilitees to a better understanding of self and others.
2. Carrying on a program of personality testing to:
    a. Enlighten both the Personnel Consultant and his enlisted assistants as to the nature and types of personality difficulties and personality structures possessed by the rehabilitees.
    b. Measure changes in attitudes and anxieties resulting from the program of group psychotherapy at the Center.
3. Acting as Personnel Consultant to the Commandant and other officers of the Center on matters pertaining to group and individual rehabilitee morale and development.
4. As Classification Officer, carrying on duties common to all Classification Officers but with the major function of recommending assignments when rehabilitees are considered ready for restoration by the administration.
5. Scheduling a lecture program for guard and custodial personnel to give them a better appreciation of the problems they face in their relationships with rehabilitees as well as means to solve these problems.

THE NEW ARMY INDIVIDUAL TEST OF GENERAL MENTAL ABILITY

STAFF, PERSONNEL RESEARCH SECTION, CLASSIFICATION AND REPLACEMENT BRANCH

The Adjutant General's Office

The Army Individual Test has been prepared by the Personnel Research Section in response to numerous requests from the field for an individual test of general learning ability. In the absence of any test prepared by the Army for Army-wide use, these requests frequently have specified one or another of the widely known individual tests that provide measures of mental age and IQ for adults. However, none of these tests meets all of the requirements for an individual test for Army use, particularly since the concepts of the MA and IQ are not meaningful in the Army situations in terms of the evidence available.

For the most part, the need for an individual test has been reported by three general types of installation. Two of these, Special Training Units (where men who cannot read and write English are taught to do so) and Replacement Training Centers, have wanted a test that could be used to back up recommendations for or against discharge because of inaptitude. Army hospitals, convalescent centers, and the like, have requested an individual test to be employed together with other clinical techniques in psychiatric diagnosis.

The use of an individual test of general mental ability, in addition to the Army General Classification Test, is based on the consideration that the individual test, while measuring the same abilities as the group test, will in some cases yield a more valid measure of those abilities, or will yield useful information of a clinical nature gained from observing the individual's behavior in the testing situation. It is, of course, true that some men, particularly within the standard score range from 50 to 80 (minus 2½ sigma to minus 1 sigma), do not display their real ability on a group test and that, for these men, an individual test may be used to discover behavior and abilities that fail to appear in the group testing situation.

With these facts in mind, it was decided to build an individual test of general mental ability, especially for Army use. Certain specifications were set for the new test.

1. It must cover the same range of abilities as the Army General Classification Test and be validated against that test. (These are obvious requirements since the demand was for an individual test measuring the same abilities as the Army General Classification Test.)
2. It must contain both verbal and nonverbal or performance material.
3. It must be applicable to both white and Negro soldiers.

4. It must take the minimum testing time consistent with maintaining adequate reliability and validity.
5. Its content must be appropriate for and interesting to Army personnel.
6. It must not presuppose that trained psychometricians will always be available.
7. It should require a minimum of testing materials involving special procurement.
8. It must be standardized and calibrated so that each soldier tested is compared with the population to which he belongs, that is, the population of soldiers in the Army. The scale in which the measurements are expressed must be, therefore, a standard score scale or a percentile scale but not a mental age scale which would imply comparison with the average mental abilities of children of specified ages, an irrelevant and misleading comparison.

The construction of the new Army individual test began with the selection of seventeen tests for the initial try-out. These included six tests from a commercially published individual scale widely used in the Army and eleven other tests either constructed by this office or adapted from other sources and revised to fit the Army situation. The tests tried out were:

Verbal Tests

- General Information
- General Comprehension
- Digit Span
- Digit-Symbol Substitution
- Series Completion
- Vocabulary (25 general terms, 25 military terms)
- Story Memory
- Similarities-Differences
- Counting Backwards

Nonverbal Tests

- Block Designs (reproducing with blocks designs presented on cards)
- Spatial Orientation (finding directions on a map)
- Shoulder Patches (making a shoulder patch from cut-out cards)
- Cube Assembly (assembling cubes into piles as shown on a chart)
- Trail Making (connecting numbers and letters by lines drawn in a definite series)
- Cube Adaptation (returning a set of cubes to their original positions after the cubes had been displaced)
- Serial Memory (memory for a series of auditory clicks)
- Window Completion (completing a spatial design)

The main validation study was conducted with a sample of 465 trainees, including 250 white and 215 colored soldiers. The original plan called for 50 white and 50 colored soldiers from each of the five Army grades on the Army General Classification Test so that the full range of ability on that test might be represented. It was found impracticable in the course of the study, however, to obtain a full quota of Grade V white or of Grade I colored soldiers, and the numbers in those categories were somewhat reduced. All the men were native-born literates in regular Army training. The groups were approximately equal in age. There was, of course, a marked relation between years of education and score on the Army General Classification Test. All of the experimental tests were administered to this population, and the data were then analyzed.

It was possible to estimate the reliability for thirteen of the experimental tests by means of Kuder-Richardson formula #20* and variants of that formula. Table I gives the reliabilities for these tests for the white population tested; the reliabilities for the colored group are practically the same.

TABLE I

RELIABILITIES OF EXPERIMENTAL TESTS

N = 250

Verbal Tests	
General Information	.88
General Comprehension	.82
Series Completion	.81
Vocabulary	.92
Story Memory	.92
Similarities-Differences	.91
Nonverbal Tests	
Block Designs	.88
Spatial Orientation	.74
Shoulder Patches	.64
Cube Assembly	.77
Trail Making	.84
Cube Adaptation	.50
Serial Memory	.78

The data for the white and colored soldiers were analyzed separately throughout. It was found that white and colored subjects with the same Army General Classification Test score made approximately the same score on the seventeen tests. On the nonverbal tests, small and insignificant differences were rather consistently in favor of the whites while the colored groups showed some superiority on the verbal tests. The correlations of the tests with the criterion differ insignificantly for the white and colored populations.

The various test intercorrelations and the correlations of each test with education and the criterion for the white group are shown in Table II.

The selection of tests for the final battery would be a fairly simple problem if statistical considerations completely determined the choice. In addition to statistical considerations, however, weight was given to

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* Kuder, G. F. & Richardson, M. W. The Theory of the Estimation of Test Reliability. *Psychometrika*, 1937, **2**, 151–161.

TABLE II

INTERCORRELATIONS OF THE EXPERIMENTAL TESTS AND CORRELATIONS WITH EDUCATION AND WITH THE ARMY GENERAL CLASSIFICATION TEST FOR THE WHITE SOLDIERS

N = 250

	Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Verbal																				
General Information	1		.67	.50	.61	.59	.82	.58	.76	.62	.57	.51	.52	.51	.62	.33	.37	.45	.70	.81
General Comprehension	2			.45	.55	.46	.70	.49	.68	.56	.49	.40	.34	.36	.51	.25	.28	.33	.60	.65
Digit Span	3				.42	.49	.53	.42	.51	.50	.38	.36	.33	.37	.40	.32	.44	.31	.55	.62
Digit-Symbol Sub.	4					.63	.62	.50	.68	.56	.64	.36	.48	.52	.67	.40	.42	.50	.72	.71
Series Completion	5						.65	.59	.66	.52	.67	.38	.61	.54	.59	.40	.41	.48	.65	.67
Vocabulary	6							.65	.79	.61	.57	.43	.53	.44	.60	.27	.36	.51	.73	.84
Story Memory	7								.61	.45	.49	.37	.43	.44	.49	.39	.42	.38	.56	.63
Similarities-Differences	8									.64	.61	.48	.53	.52	.62	.33	.43	.50	.75	.79
Counting Backwards	9										.47	.38	.37	.41	.48	.30	.39	.44	.58	.65
Nonverbal																				
Block Designs	10											.37	.62	.63	.63	.44	.41	.56	.56	.65
Spatial Orientation	11												.35	.36	.35	.12	.28	.27	.37	.41
Shoulder Patches	12													.53	.51	.32	.32	.56	.47	.52
Cube Assembly	13														.50	.41	.31	.45	.49	.56
Trail Making	14															.40	.43	.46	.62	.68
Cube Adaptation	15																.38	.20	.27	.35
Serial Memory	16																	.24	.40	.46
Window Completion	17																		.43	.49
Schooling	18																			
AGCT	19																			

the requirements of economy, balance of verbal and performance tests, equal applicability to white and colored trainees, saving of time, simplicity of equipment, and suitability for general Army use—the requirements laid down when construction of the new test was begun.

Six tests were chosen for the final battery: three verbal and three performance. The three verbal tests first chosen were Similarities-Differences, Story Memory, and Vocabulary. However, it was found advantageous to substitute Digit Span for Vocabulary. Digit Span was an exceptional test in that its predictive value was much higher for the colored group than for the white. Its inclusion raised the correlation of the final battery with the Army General Classification Test from .69 to .74 for the colored group while not affecting the correlation for the white group (.84). Digit Span is the only numerical test in the battery and is much shorter and more objectively scored than Vocabulary.

The three performance tests selected were Trail Making, Cube Assembly, and Shoulder Patches. While Shoulder Patches did not show up as well statistically as other tests in this study (correlation with the Army General Classification Test, .52; reliability, .64), its appeal to the testee was such that it was decided to revise the test and the scoring for another try-out. The revised test was given to 200 white soldiers, 40 in each Army grade on the Army General Classification Test. The reliability of the revised test was found to be .86 and its correlation with the Army General Classification Test .65; therefore, Shoulder Patches was included in the final battery.

The six tests of the final battery, which is called the Army Individual Test, AIT-1, are given in the following order: Story Memory, Similarities-Differences, Digit Span, Shoulder Patches, Trail Making, and Cube Assembly. All subtests must be given; no subtest is ever given separately.

The Army Individual Test has been standardized and norms in the form of Army grades and standard scores have been prepared. The standard scores for this test are defined as having a mean of 100 and a standard deviation of 20, the same as the standard scores for the Army General Classification Test. The test was standardized on a group of 1,000 soldiers selected to be representative of the total Army population with respect to their scores on the Army General Classification Test. The reliability of the final battery, as estimated by Kuder-Richardson formula #2* is .93 for the white population. The intercorrelation of the tests in the final form, and the correlations of the tests with the Army General Classification Test are given in Table III.

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* Kuder, G. F. & Richardson, M. W. The Theory of the Estimation of Test Reliability. *Psychometrika*, 1937, 2, 151–161.

TABLE III

Intercorrelations of Subtests of Army Individual Test and Correlation with Army General Classification Test

N = 1,000

		1	2	3	4	5	6	7
Story Memory	1		.61	.38	.45	.41	.37	.61
Similarities-Differences	2			.45	.54	.54	.42	.71
Digit Span	3				.38	.42	.32	.56
Shoulder Patches	4					.48	.60	.61
Trail Making	5						.43	.65
Cube Assembly	6							.54
Army General Classification Test	7							—

In the standardization of the tests, the weighting procedures that should be used in order that the verbal and nonverbal tests contribute the same amount to the variance of the total score on the test were determined. The optimum weights are as follows: Similarities-Differences, 2; Digit Span, 4; Trail Making, 2; all other tests, 1. The correlations of the total weighted score on the verbal tests, the total weighted score on the nonverbal test, and the total of both verbal and nonverbal tests with the Army General Classification Test are as follows:

Verbal tests	.78
Nonverbal tests	.74
Total test	.84

The test, in its final form, requires very few materials. For the verbal tests, all the materials needed are the score sheet and the manual. The three performance tests require, in addition to the score sheet and the manual, certain other materials: for Shoulder Patches, one sample and nine Shoulder Patch cards together with nineteen colored cards with which to build the designs; for Trail Making, a pad of test sheets; and for Cube Assembly, 24 one-inch cubes and three pictures of assembled cubes.

The tests are easy to administer. Story Memory is based on a short paragraph describing a military incident. The paragraph is read to the examinee who is asked to repeat it and answer questions. Similarities-Differences consists of pairs of words; the man being examined tells how they are alike and how they are different. One point is given for an acceptable similarity and one point for an acceptable difference, making a maximum score of 2 for each item. Digit Span consists of series of from three to ten digits which the examinee is to repeat in the order given and series of from three to nine digits which the examinee is to repeat backwards. In the Shoulder Patches test, the examinee is given a colored design which he must duplicate using colored cut-out designs. In Trail Making, the subject draws lines from number to number or from letter to letter in sequence; the score depends on the time required for an errorless performance. In the last test, Cube Assembly, the examinee is given a picture and cubes with which he must duplicate the arrangement shown in the picture. The score depends upon time to complete the test.

About 40 minutes are required for administration of all six tests.

Thus, the new Army Individual Test meets the specifications laid down for its construction: it is valid and it is practical. Its validity in terms of the Army General Classification Test is high. It contains both verbal and nonverbal materials which contribute equally to the variance of the total score. It is applicable to both white and Negro soldiers. It requires a minimum of testing time and trained psychometricians are not needed to administer it. A minimum of testing materials requiring special procurement are needed. Finally, it is so standardized that it compares each man with other men in the Army by means of standard scores; MA's and IQ's are not used in any interpretation of the test scores.

SOME TESTING NEEDS IN MILITARY CLINICAL PSYCHOLOGY*

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Psychologists in military service are of necessity required to rely greatly upon equipment and procedures developed in civilian life. True, much that is new and important has been accomplished within the armed forces themselves, but modifications of peacetime practices are often mainstays of the psychological armamentarium. In fact, the psychologist in clinical work has little else. Since methods developed in other circumstances will have limitations when they are applied in wartime, it seems worthwhile to point out some needs which have become apparent in the experience of one person engaged in naval clinical psychology. The present paper discusses some of the needs in clinical testing and suggests a possible way of meeting them.

The general nature of psychological work in naval Neuropsychiatric Units has been described by several authors whose papers are summarized by Hunt, in the present symposium. As they show, one of the chief contributions of the clinical psychologist in the unit is the administration and interpretation of tests to recruits suspected of neuropsychiatric handicaps. Intelligence tests, of course, are of first importance, but the psychologist is often asked to furnish such other test data as may be available in order to evaluate more fully the recruit's fitness for service. The usefulness of the psychologist in such situations, then, is directly related to the amount of relevant test information he can rapidly assemble. Unfortunately, that kind of information is rather limited at present.

The first factor which limits the number of usable tests is the long testing time required by most published tests. Lewinski and Pennington (1, p. 522) point out:

> Because of the national emergency, psychometry in the Navy must necessarily be expeditious. Involved and time-consuming tests, while frequently of value, are not practicable when large numbers of persons must be examined in relatively limited periods of time.

What constitutes an impracticable testing time depends upon local conditions, but experience at Parris Island suggests that any test requiring more than 15 minutes will be little used. This conclusion seems to apply in other activities, for both papers cited above refer to 10 minute intelligence tests in a way indicating that they are used frequently.

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* The opinions and assertions contained in this paper are the private ones of the author and are not to be construed as official or as reflecting the views of the Navy Department or the naval service at large.

We may remind the horrified civilian psychologist that the recruit has much to do besides taking tests, and reassure him that when possible longer tests are given. But if more tests are to be made available for military use, they must be short.

A second limitation of extant tests, particularly those in the field of personality, is the relatively high reading level required of subjects before the test can be administered. A wide range of reading ability is found among recruits, and often the very cases where testing could be most helpful are unable to understand many of the usual personality inventories. Anyone who has tried to formulate test items which would be clear and unambiguous for college students can appreciate the impossibility of administering those same items to practical-minded adults with limited schooling. No matter how effective the various inventories and schedules may be in other programs, they cannot be expected to work with men who stumble through seventh grade reading paragraphs. Even such a direct question as "Do you have fainting spells?" will be answered "yes" by persons who have grand-mal seizures, those who have suffered heat-exhaustion, those who have dizzy spells, and those who one time thought they were about ready to faint. In general, clinical tests, to be useful in Neuropsychiatric Units, should be couched in simple language and be capable of oral administration.

In connection with the matter of reading level, it should be stressed that directions for the subject must be easily grasped and the performance required of him in responding must be simple. In navy clinical work, tests are usually administered individually, and complex instructions take added time for every person tested. It requires more time than it is worth to teach a man to answer by using a 5 point scale. Simple yes-no answers, placing cards in boxes, or checking items in a list are capable of being widely applied.

A third disadvantage of some published tests is the length of time needed for scoring and interpretation. As a rule, those tests are most appropriate which can be scored and interpreted within 5 minutes after administration. Some rather remarkable achievements are possible in this respect. The Kent Oral Emergency Test can be scored and the credits summated while the recruit is answering, and the mental age can be found in a few seconds. The Bellevue Scale can be scored during administration by tallying the credits for each answer as it is given, and if typed copies of relevant tables are at hand the weighted scores and I.Q.'s are determined in less than a minute. The Rorschach, on the other hand, requires from 20 to 60 minutes to score and interpret. If the recruit has several interviews in succession, it is almost impossible to make Rorschach results available to the next interviewer. Scales having a number of scoring keys with a wide range of weights are also of limited usefulness. Of course the information given by these longer tests is sometimes worth the added time, but often it seems more advisable to devote that time to a direct interview. If a printed form is used for recording individual tests, the inclusion of tables of norms on the record sheet will save time.

The reliability and validity of published tests need not be discussed here except to point out that more representative samples of the population should be used in establishing these qualities. Norms appropriate to the military situation can be collected as needed provided the tests are practical, but the clinician wants assurance that the validity of a test is not impaired if it is used with non-college samples.

Since few present tests have features which enable them to be used in examining recruits, new ones ought to be constructed. The question is whether or not it is feasible to construct short, rapidly scored, and easily understood tests which will possess any validity. We believe such tests can be produced because of one important difference between military clinical work and civilian testing. The difference lies in the fact that in the former case the test is not required to be discriminative except at one extreme of the trait continuum, while in the latter case the test should be discriminative throughout the entire range of the trait.

As a rule the recruit examination is devoted to the identification of deviate persons; more specifically, the psychologist wishes to identify deviates who will be of no value to the armed forces.* He is not primarily interested in whether or not a recruit has made a better than average marital adjustment or a somewhat below average job adjustment, but he is interested in locating those whose adjustments have been poorer than, say, 90% of the men of military age. It is the excessively worried, withdrawn, or homesick persons who must be studied rather than those who are only mildly so. If this view is adopted, a test need differentiate only between the atypical and the somewhat atypical person to be satisfactory.

Such tests may be contructed by using items to which a very large proportion of the population studied will respond in a given way. With two choices, A and B, an item will be satisfactory if from 75% to 90% of the standardizing sample select A. The choice of B is, then, in itself an atypical performance. Items so chosen tend to intercorrelate positively, and total scores yield a markedly skewed distribution. The tail of this distribution contains scores of persons who have an undesirable degree of the trait in question. A cutting score may be determined, and validation carried out using bi-serial correlation. The number of items needed to produce sufficient scatter at one extreme is much smaller than the number needed to give spread to the whole trait range.

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* The aim of psychologists who are engaged in classification is entirely different, and their tests must be discriminative at all points of the trait continuum.

Promising results have been obtained in exploratory studies with this technique. In one case, a list of 20 items which could be administered orally in about 3 minutes was found to differentiate effectively between neurotics and randomly chosen controls. The cutting score was exceeded by only 2% of 100 controls but was exceeded by 50% of 50 neurotics. Similar results have been obtained from equally short check lists of interest.

Since this proposal makes very short tests possible, it should be a simple matter to give and score as many as 5 or 6 in a half-hour interview. Tests dealing with special traits, rather than over-all diagnoses, would be of greatest use. The manual by Wells and Ruesch (2) contains material which could be adapted for rapid checks of intellectual functions. Conceivably, excessive worriers could be identified by a check list of topics so selected that only 10% or 20% of the population worried about each one. Descriptions of infrequent acts of resistance may be used to find those who react adversely to authority. It should not be extraordinarily difficult to make short questionnaires dealing with marital adjustment, dependence on the family, lack of self-confidence, and similar subjects.

Although short tests would be most valuable in the rapid screening of recruits, non-military uses probably exist. In industry we may wish to eliminate applicants who are atypically submissive or intolerant, although we may have no interest in the milder degrees of these traits. Sometimes we wish to locate persons who are unusually exceptional and desirable with respect to some trait. Theoretically this problem is solved by the techniques we have described, but in such cases the need for saving time is usually not great enough to warrant the use of the short test if longer ones are available.

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THE CLINICAL PSYCHOLOGIST IN AN AAF MENTAL HYGIENE UNIT

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The present paper describes the manner in which one Mental Hygiene Unit (MHU) is organized and the job performed by its psychological staff.

In discussing the disposition of neuropsychiatric cases in the Armed Forces, a circular letter from the Office of the Surgeon General stated that "each case must be evaluated individually and disposition made on basis of clinical judgment as to the individual's potential value to the service" (1).

Although this was published almost a year after the establishment of the Mental Hygiene Unit at Drew Field, it aptly summarizes the philosophy and policy of that unit. As stated in a memo issued by the Third Air Force, the MHU is set up:

> A. To provide assistance to military personnel who present various forms of maladjustment such as inaptitude, unusual behavior, malingering, recalcitrance, goldbricking and alcoholism.
>
> B. To recommend corrective measures to reduce or eliminate the individual's maladjustment and to eradicate environmental factors causing mental breakdown.
>
> C. To determine, in coordination with Unit Classification Officers, whether individuals are in assignments that do not utilize their capabilities to the fullest extent possible, or are being trained in a skill beyond that capacity.
>
> D. To recommend the discharge of individuals who because of mental or emotional factors are not functioning adequately and those who are a hazard to others. Within this category are persons found to be psychotic, severe psychoneurotics, epileptics, psychopaths, morons, chronic alcoholics, enuretics and drug addicts.
>
> E. To secure psychiatric, psychological and social data for presentation to courts-martial and discharge boards.
>
> F. To cooperate with the Red Cross and similar civil agencies to the end that discharged personnel will be given assistance in their return to civilian life.

The MHU consists of a psychiatrist who is the director of the unit, an assistant director who is the administrative officer and supervisor of the psychology department, ten psychiatric social workers, two of whom are WACS, and a psychology department of three psychologists. One of the psychiatric social workers is a clinical psychologist who is devoting half time to work with projective techniques. The psychiatrist and assistant director are officers. All other personnel are enlisted men.

Psychiatrist, psychiatric social workers, and psychologist work as a clinical team. This has posed the chief problem of the use of a common language and the translation of the results of psychological tests into case work and psychiatric terminology. The case workers and psychiatrist have also adapted many of the psychological concepts as well as the more specific information about particular tests. In the process of working together the uniqueness of the contribution of each member of the clinical team is brought out, and the value of such a coordinated approach is emphasized.

In an unpublished study of soldiers referred to the MHU in the past year, it was found that the far greatest percentage presented intrapersonal problems, the most common symptoms being anxiety, insomnia, fears, obsessions and nervousness. Somatic complaints, such as gastric and cardiac symptoms, headaches and pains in arms or legs or back, were present in a much lesser number. Referrals for interpersonal problems, including violations of military law and inability to get along with other men and officers, constituted a still smaller group. The primary sources of referral were medical officers and commanding officers. Classification officers, Red Cross workers, and chaplains also referred soldiers to the unit. Some very few were self referrals.

Psychiatric case workers* see all men referred to the unit. A case history (2) is taken which contains a study of the areas of (a) family relationships, (b) past personal history, which includes early development, medical, scholastic, occupational and legal history, (c) social history, covering socio-sexual development, civilian and army recreational pattern, extent and influence of religious participation, (d) army record, training received, job classification, record of courts-martials, ratings of character and efficiency, (e) statement of the details of present illness, (f) description and evaluation of mental and emotional status, which includes the report of the psychologist, and (g) interpretation of the case by the case worker.

Red Cross histories are obtained on the majority of patients. These include a complete history of the individual in his familial and community setting prior to army induction and follow the same general case history outline as that used at the unit, so there is both a check and a supplement to the information gathered here. Other community sources from whom information is frequently requested are civilian doctors, hospitals and various correctional institutions.

In the course of the case workup by the psychiatric social workers, patients may be referred for psychological examination.* The usual types of problems are (a) determination of the level of intellectual functioning, (b) determination of the presence and extent of deterioration (c) analysis of the structure of personality, its efficiency, and areas of conflict, (d) assistance in the selection of patients for psychotherapy and the appraisal of the effects of ongoing or completed therapy, and (e) evaluation of failure in army assignment.

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* Qualifications of the military psychiatric social worker: The job title, social worker, is assigned to persons having had two years of supervised experience in a private or public agency performing regular supervised case work. Graduation from a recognized school of social work with a degree or membership in the American Association of Psychiatric Social Workers will satisfy requirements (3, p. 55).

All five types of problems are handled by the same devices, the administration and interpretation of psychological tests. Experience has contraindicated the use of a wide variety of statistically standardized group personality tests. It was found that the numerical scores added little to the clinical understanding of the patient. This fact, and the military need for a reasonably short psychological supplement to a clinical workup have limited the psychological test battery to a Wechsler Mental Ability Scale, Form B, the Rorschach and the Thematic Apperception Test. Non-language tests and Army General Classification Tests are administered by the Base Classification Unit and are incorporated in the psychologist's report. Aptitude tests are usually reported on the Soldier's Qualification Card. When it is desirable further to assess a soldier's aptitude for any given job placement or school, he may be referred to the Base Classification Officer for the necessary test administration.

The findings of the psychologist are incorporated in the case record prepared by the case worker. Case worker and psychiatrist confer on each case, arrive at a diagnosis and make plans for disposition. The attempt is made to formulate the psychological report in terms which will assist them and which will be meaningful in solving problems of differential diagnosis and in planning a treatment program. Usually mental age, intelligence quotient and Army Classification grade are reported for the intelligence test. In certain instances analysis of scatter may reveal or substantiate evidence of organic pathology or particular neurotic processes. Rorschach reports are concerned with the various elements of the diagnostic picture and, wherever indicated, the areas which may be positively affected by psychotherapy. The Thematic Apperception Test, has, so far, proved most useful in indicating content of emotional conflicts and the kinds of attitudes and relationships which the patient has to various persons, towards being in the army and, occasionally, towards his own problem.

* The psychologist will be an enlisted man with the military occupational speciality of 289 and the job title of Personnel Consultant Assistant. He must be a college graduate and preferably have a Ph.D. from an accredited college or its equivalent in clinical psychology. It is desirable that he have experience in a psychological agency under the supervision of a psychiatrist so that he will be familiar with personality problems and the methods of handling them (3, p. 56).

The psychologist uses all of the material gathered by the case worker and makes his own observations of test behavior in addition to obtaining the results of the tests. His report may also indicate whether the soldier is properly placed vocationally for his intelligence, aptitude and temperament. Since many of the symptoms for which soldiers are referred arise from job dissatisfaction, use of tests for proper vocational placement is an extremely important aspect of the psychological program. It relates directly to the unit's main objective of making the most effective use of personnel.

Diagnoses, made by the psychiatrist, include practically all of the classical psychiatric categories. Fewer psychotics are seen because the service is primarily an out-patient one. In addition to diagnosis, adaptability to military life is also considered in determining the disposition. Only when adaptability is extremely poor is discharge considered.

Dispositions are of three kinds. Among referrals to the MHU, many were returned to duty, some were recommended for discharge, and a small percentage were hospitalized for further study. The category of *return to duty* consists of return to duty with further action, return to duty with reclassification or reassignment, and return to duty with therapy. When reclassification is made as a recommendation, the patient is referred to the psychologist who makes the necessary reclassification on basis of the patient's personality as indicated by the case record, his qualification card containing his history of civilian and military occupational history, schooling, aptitude and intelligence level. Job recommendations are made within the army framework as defined by army regulations. The procedures of reassignment and reclassification are outlined in the War Department regulations, memoranda, circulars and other documents and these serve as the guides for the psychologist. All the psychologists concerned with classification have attended the Army Personnel Consultant Schools.

Patients scheduled for therapy are treated by the psychiatrist and the psychiatric social workers. Reports of the Rorschach and the Thematic Apperception Test are most useful in this area. Occasionally the material from the Thematic Apperception Test is used as the starting point for extended therapy. Evaluation of therapy, mentioned earlier as one of the functions of the psychologist, might rather be designated as one of the *objectives* because of the difficulty in making this type of evaluation. The prime criterion of the effectiveness of therapy at the present time is the extent to which the symptoms are removed and adjustment to the army duty is made, or that adjustment to army duty is made despite the presence of symptoms previously felt to be disabling by the patient.

The research done by the psychology department is secondary to the service needs of the unit, and is oriented towards solving practical day to day problems. Studies have included an analysis of the case histories of men referred to MHU, a test of the validity of the Harrower-Erickson Multiple Choice Test for screening, and the construction of a test for screening. There is a study in progress on the use of projective techniques for evaluation of therapy.

The psychologists participate in the training program for the unit's professional personnel, and have led several discussions on psychological problems at the weekly seminars. They take part in the bi-weekly staffing of cases.

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A.A.F. CONVALESCENT-REHABILITATION PROGRAM

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The Army Air Forces Convalescent-Rehabilitation program is designed to receive Army Air Forces casualties from overseas and to provide for them a rehabilitation service. The service developed for these casualties includes both medical and non-medical aspects of rehabilitation. Those admitted to the Convalescent-Rehabilitation centers have, in most cases, already received definitive medical treatment at Army General Hospitals or A.A.F. Regional Hospitals. This selection excludes casualties such as the blind and psychotic.

It is the primary purpose of the program to return as many casualties as possible to their former military duty in the Army Air Forces. For those whose disabilities prevent their returning to their former duties, reassignment is made in accordance with their training, experience, and limitations. To those who are unable to achieve the minimum requirements for military duty, a Certificate of Disability Discharge (CDD) is offered.

The type of patient assigned to a Center determines the nature of the organization and program that is developed there. One Convalescent Center receives orthopedic, psychoneurotic, "operational fatigue," and general medical and surgical cases.*

Each center is under the direction of a medical officer who supervises the organization of all activities. The Convalescent-Rehabilitation program for each patient is initiated through a combined medical, physical, psycho-social, and vocational-educational evaluation. The program for the individual, therefore, takes into account medical-surgical needs, physical limitations, psycho-social problems, the individual's interests and abilities, his goals and attitudes, the probable length of the convalescent period, and the nature of his probable disposition. The activities program based on these considerations includes athletics, recreation, physiotherapy, individual and group psychotherapy, educational classes and projects, specialized vocational training, job trial, a physical-fitness program, and entertainment. The various coordinated activities shorten the convalescent period for each patient and, at the same time, prepare him for new military duties or to take his place in civilian life.

The complete vocational-educational evaluation of each patient is made under the direction of the Vocational Guidance Officer. Future assignment is recommended on the basis of this evaluation. The patient receives instruction in subjects related to this assignment, and is given job trials whenever possible. In the case of patients who are to be returned to civilian life, the evaluation is directed toward the proper placement of the individual in civilian employment. Each patient is instructed concerning the agencies which will assist him in his return to civilian life. Particular emphasis is placed on available channels and opportunities for job placement.

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* At this writing there are three psychologists assigned to this Convalescent Center and two assigned to a branch located in the same state.

The clinical psychologist contributes to many aspects of the total program. He is concerned primarily with the psycho-social adjustment of the returned soldier. He conducts therapeutic group discussions and counsels individuals on adjustment problems. The group therapy is designed to meet the problems of overseas casualties who face readjustments to non-combat conditions in the United States. This type of therapy is conducted in small, informal groups. Here the individual, under the leadership of the psychologist, discusses attitudes and problems developed as a result of his overseas experiences, his present and anticipated problems of readjustment, and current socio-economic issues. The psychologist also contributes by counseling soldiers about to be discharged from the service. One of the problems to be met by this group is that of the disabled veteran returning to his home and family. In addition, the returning veteran must be prepared to accept intelligently the responsibilities and freedom which will be his in civilian life.

By means of brief interviews with all new patients, the psychologist screens those presenting adjustment problems. In addition, cases are referred to him by the medical consultants. As individual counselor, the psychologist performs duties which include case-history studies, psychotherapy, diagnostic testing, and the development of individual rehabilitation programs for patients presenting special problems such as illiteracy and aphasia. In this connection, the psychologist comes in contact with cases involving psychoneurosis, "operational fatigue," constitutional psychopathic states, psychosomatic disorders, brain injuries, situational anxieties, and conversion hysterias. For those cases in which a long-term or extensive psychotherapy is indicated, the psychologist conducts counseling ranging from the non-directive type for complex personality problems, to more directive counseling of a social-psychiatric case-history nature for cases involving situational reactions. These psychiatric cases have all received initial diagnoses by military psychiatrists, and the individual case-work must be done under the supervision of the psychiatrist.

Another related function the psychologist performs is the administration and interpretation of diagnostic tests. The results of these tests are used for evidence in establishing diagnoses, measurement of progress, and as a guide for clinical procedures. Tests used in this area include individual intelligence tests, personality tests, memory and deterioration tests, and special tests for diagnosis of organic brain pathology.

Individual intelligence tests used by the Center are the Bellevue-Wechsler Mental Abilities Scale, Form B, and the Stanford-Binet, Form L. The Kent Emergency Tests, the Otis Self-Administering Tests of Mental Ability, and the Modified Alpha Examination (Form 9) have been employed when only a rough index of mental ability was required. The personality tests that have proved profitable are the Rorschach, Murray's Thematic Apperception Test, and the Minnesota Multiphasic Personality Inventory. The Wells Memory Tests, the Wechsler Memory Scale (unpublished) and the Shipley-Hartford Test have been used for the study of memory and mental deterioration. The Bender Visuo-Gestalt tests, the Goldstein Blocks, the Porteus maze, and the tests as outlined by Weisenberg and McBride for aphasic disturbances have been used in cases of suspected organic brain pathology.

The psychologist contributes to the vocational-educational aspect of the rehabilitation program by administering and interpreting tests of aptitude, achievement, vocational interests, intelligence, and personality. The tests are usually administered individually at the request of the Vocational Guidance Officer.

In addition to the tests described in the previous paragraph that are applicable to this area, use is made of the Kuder Preference Record, Strong Vocational Interest Blank, Army General Classification Tests, Minnesota Paper Form Board, American Council on Education Tests, and the Stanford Achievement Tests.

Under the direction of the clinical psychologists, a library of testing materials, periodicals, and standard reference works related to the psychological aspects of rehabilitation is being collected for use in the Center. Additional tests are needed to meet specific problems, and many others could be used experimentally in order to determine their value in the Convalescent-Rehabilitation program. Tests listed in this paper are not presented as an ideal testing battery but represent the tests that could be secured and put to immediate and profitable use.

CLINICAL RESEARCH IN THE AVIATION PSYCHOLOGY PROGRAM OF THE ARMY AIR FORCES

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Until May, 1944, practically all of the work of aviation psychologists in the Army Air Forces was in the Training Command. Descriptions of their activities have appeared in recent issues of the *Bulletin* (1, 2, 3, 4, 5, 6). During the first two years the emphasis was on research for the development of instruments for the selection and classification of large numbers of candidates for air-crew training. During the past year, however, there has been an increasing emphasis on new types of research and service, particularly on problems of training methods, instructor selection, selection of flying personnel for key positions in combat, and the redistribution and rehabilitation of returnees.

These newer efforts have also been characterized by an emphasis on objective, large-scale procedures, on machine-scored paper and pencil tests, clock- or counter-scored apparatus tests, and the statistical treatment of grades, ratings, bombing scores, and similar quantitative data. The contributions of psychologists in the Air Forces have thus been primarily in the field of measurement rather than therapy. However, clinical methods have played an important part at certain points, especially in the development of a number of objective tests and in the evaluation of certain training and assignment procedures. A few of the more significant studies utilizing clinical psychological methods are briefly described in this paper.

CASE STUDIES OF PILOTS IN TRAINING

Fundamental to any program of personality test construction is the availability of adequate studies of men who fall into the classifications to be predicted, in this case, those who succeed and fail in flying training. Accordingly, Psychological Research Unit No. 1, Maxwell Field, Ala., (Sept. 21, 1941 to July 7, 1942, and since March 15, 1944) and Nashville, Tenn., whose research mission is the development of personality and temperament tests for the prediction of success in flying training, sent a detachment to a primary flying school to make a job and man analysis of pilot training. One officer (Capt. Neal E. Miller) was responsible for job-analysis, the other (Capt. Donald E. Super) for case studies; they were assisted by an enlisted psychologist (S/Sgt. John L. Wallen) who kept records and tested and interviewed the cadets being studied.

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* The author was selected by the Psychological Branch, Hq. AAF, to write up these projects because of his participation in several of the researches and familiarity with the others. The responsibility for the details of the research described rests with the project personnel.

Procedures in the Field. The procedures in the clinical phase of the work were as follows. The two officers entered primary flying school with a new class, and were quartered in different barracks, with two different flights of 28 men each. Although both officers were to some extent participant observers, the job-analyst made observations on only a few individuals (devoting more time to flying and job-analysis interviews), and the man-analyst observed all of his flight of 28, studying most of them intensively as a participant observer. He followed the same schedule as his subjects, eating, going to ground school and calisthenics, flying, handling planes on the ramp, and going on open post with them.

Although the officers wore their insignia and the cadets observed the usual military courtesies, excellent rapport was established. At the cadets' first orientation meeting, the Commandant of Cadets briefly introduced the psychologists and explained their mission as one designed to improve classification procedures, one which would not affect the standing of the present class in any way. The detachment saw to it that their behavior supported this statement; for example, during the first day cadets soon forgot the presence of the officers and occasionally made critical remarks concerning the school, then remembered the observers. When these slips resulted in no reprimands, confidence grew. Soon the observers were completely accepted, as many little incidents testified, including the bestowing of free membership in the "Short-Snorters," tossing in the showers after the first solo, and exchanges of letters since graduation.

Twenty cadets were singled out for special study, the enlisted psychological assistant making a preliminary selection on the basis of stanines (flying aptitude scores) in order to get samples of high and low aptitude cadets, and the officers making suggestions on the basis of observations with no knowledge of the stanines. The assistant interviewed each of these cadets after they began taking their pre-solo checks and some were about to be eliminated (after about two and one-half weeks), and then administered Murray's Thematic Apperception Test. The interview lasted one hour or more and, while it allowed the cadet a good deal of freedom to talk as he pleased, covered family history, education, job experience, attitude toward war and flying, and the other usual items of a clinical history.

The officers kept notes on the observed behavior of their cases, jotting them down at convenient moments. Data were thus obtained in situations ranging from inter-changes in the washrooms, through critiques by instructors after flying, to scraps of talk and exclamations while asleep at night. Cadets were frequently engaged in conversation before and after check flights and were thus, unbeknownst to themselves, interviewed concerning their flying behavior and attitudes at critical times. Their instructors were also interviewed, more formally.

Six weeks were spent in these activities in primary school. The two officers went to basic and advanced flying schools for periods of about one week each while the same cadets were there. Similar participant-observer and clinical-interview techniques were used, supplemented by group interviews which proved very successful in eliciting frank reactions to flying, and by analysis of instructors' flight reports.

Preparation of Histories. The detachment then returned to its home station and began the analysis of case material and the preparation of case histories. Each observer summarized his own observations, interviews, or test data; ground school grades and flight reports were analyzed; and, in a case conference lasting as long as four hours for the first few cases, but generally a little over an hour thereafter, the three clinicians discussed and agreed on a diagnosis of each case. The responsible officer then wrote a case summary of about two thousand words which was revised and discussed by each clinician until agreement was complete. A description of the training experience, one complete case history and all of the summaries, were then published as restricted research bulletins.

Analysis of Case Histories. The officer in charge of the man-analysis study then began a listing of the personality factors in each case, and of their effect on success and failure. After several revisions this list was used by two psychologists, working independently, to tabulate the incidence of personality factors characterizing graduates and eliminees. These tabulations were shown to be quite reliable. Although the total number was small (8 graduates, 11 eliminees, and one reclassified as navigator at own request), tentative conclusions were drawn which have proved helpful in test construction. More important still, dynamic pictures of the complex relationships between personality factors and success in flying training were made available to aviation psychologists, few of whom have had first-hand experience with flying training.

Conclusions. Outstanding general conclusions of the above studies were that going through pilot training is an experience full of emotional stress, that cadets who are emotionally insecure as a result of childhood experiences are less likely to succeed than are others, and that such insecurity may be turned into an asset or at least counteracted by emotional control. This, in turn, is in part indicated by habits of success, a happy marriage and a good adjustment to authority. Questionnaire studies have shown that coming from a broken home has no effect on chances of success in flying training, which seems to cast some doubt on the above conclusions. However, civilian studies have repeatedly shown that it is *psychological* rather than *material* break-up which is important to adjustment. As the case studies dealt with the former, and the questionnaire with the latter, the conclusion still stands.

CLINICAL EVALUATIONS OF AVIATION TRAINEES

After objective tests had been devised, validated, and put into use for the classification of candidates for aircrew training, certain aviation psychologists at Psychological Research Unit No. 1 were interested in investigating the predictive value of clinical diagnostic techniques, and, in a few instances, of a *clinical* evaluation of the data which might affect success or failure as opposed to the *statistical* combination of test scores in a regression equation.

Interviews. One study of the predictive value of interview procedures had already been carried out by Pvt. Albert Lehman with negative results. In this first study 110 cadets were interviewed in a relatively unstructured interview lasting 15 minutes. Each cadet was rated on eleven categories, varying from "Anxiety" to "Estimate of proper placement in aircrew duty." Criterion data later became available for 60 graduates and 25 eliminees. Although the ratings were quite reliable (agreement between two judges), they had no predictive value; the estimate of aircrew placement, for example, had a validity of .02 for pilots. It was felt, however, that the possibilities of the interview had not been exhausted, and that it should be tried in a more lengthy, more clinical form, together with other clinical techniques.

Clinical Ratings. Accordingly, a standardized clinical interview lasting about an hour and dealing with past history and present personality, the Rorschach Psychodiagnostic, Murray's Thematic Apperception Test, several observational techniques involving performance of a set task or behavior in an unstructured situation, and a variety of experimental objective personality tests were used under the direction of Lt. John W. M. Rothney, with some 600 aviation cadets. After completing the recording and review of his data, each clinician (selected enlisted psychological assistants with appropriate graduate training and experience in psychology but, with one exception, no first-hand knowledge of flying) rated each examinee's chances of success in training as pilot, navigator, and bombardier. This rating was thus based solely on an evaluation made after the administration and review of one test or interview, and on the clinician's knowledge of the requirements of aircrew training. A total of eleven ratings were made, based on approximately four hours of testing and three hours of scoring per cadet (the latter estimate is very rough, due to changes in procedures as work progressed). Eight of these ratings (interview, Rorschach impression, Thematic Apperception Test, observation during rest period, Adams-Lepley Personal Audit, confidence ratings, Behavior Preference Blank, and Self-Crediting Mental Abilities Test) subsequently proved to have no predictive value, while three of the ratings, based on the Rorschach interpretation and on the Interaction and Observational Stress Tests (ratings of behavior in set tasks), had very doubtful validities.

Rorschach Scores and Behavior Ratings. A second phase of the research consisted of the validation of test scores and part scores. One Rorschach category had a doubtful validity which did not hold up in cross-validation, and no others had any predictive value; inadequate standardization of examiners' procedures made Thematic Apperception Test data unusable for this purpose; ratings of observed behavior (co-operation, leadership, emotional stability, etc.,) had no validity (rbis from −.171 to .132); and a scoring formula for statistically selected Rorschach categories did not validate on a new sample of 156 cadets (rbis = .035). The Harrower-Erickson multiple-choice group edition of the Rorschach was later administered to 2000 cadets, but also proved to have no predictive value.

Prediction on the Basis of Case Studies. It was originally planned to make predictions on the basis of complete case histories utilizing validated clinical techniques. This was rendered impossible, however, by the lack of predictive value in the clinical instruments.

PROJECTIVE TECHNIQUES

Individual Tests. Although the Rorschach Test, used without reference to case history material, was demonstrated to have practically no predictive value for air-crew training, and the only Thematic Apperception Test data available proved unworkable (see above), the conviction has been strong among some aviation psychologists that projective techniques should be of value in air-crew selection and classification. Before either of the above tests was administered, work had been carried on at Psychological Research Unit No. 1 with the Titles Test, a series of aviation and army pictures with multiple-choice thematic responses. This work with individual techniques paved the way for work with group tests.

Group Tests. Current work with projective techniques at Psychological Research Unit No. 1 consists of several tests, now about ready for validation, growing out of work with the Titles and Thematic Apperception Tests. These have in common the brief presentation of a picture, after which the subject makes a choice from verbal or graphic multiple-choice items. They are designed primarily for the prediction of neurotic reactions to the stresses of flying training and of combat.

Further work of this kind is being carried on at Redistribution Station No. 2 for the screening of cases of combat fatigue and combat neurosis among returned fliers.

ADJUSTMENT AFTER COMBAT

Problem. Experience with aerial gunners returned from combat theaters after completion of the standard number of missions, and assigned to duty as gunnery instructors, revealed many problems in the adjustment of returnees to army life in the United States. Accordingly, Psychological Research Unit No. 11, located at the Central Instructors School for Flexible Gunnery and specializing in gunnery problems, secured the services of a civilian consultant (Dr. Carl R. Rogers) for the making of a study of the general problem of the adjustment of returned combat gunners.

Method. Three clinical psychologists used relatively unstructured procedures to interview one hundred returned combat gunners. Preliminary interviews were used to develop a guide to the areas to be explored. The research interviews lasted from forty-five to seventy-five minutes, notes were taken during the interview, and an Interview Analysis Blank was filled out after a study of the notes. This last procedure served to quantify data and to facilitate the analysis of interrelations.

Findings. Specific findings cannot be released for security reasons and because of their tentative nature. An indication can be given, however, of some of the problems studied. These included attitudes toward assignments (job satisfaction), effectiveness of instructor selection methods, incidence and effect of combat fatigue, and factors related to susceptibility to combat fatigue. Recommendations were made for the improvement of assignment and training procedures.

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THE PSYCHOLOGIST IN THE PSYCHIATRIC PROGRAM AT THE NAVAL TRAINING STATIONS*

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The main task of a Psychiatric Unit at a Naval Training Station is military selection, the detection of those recruits who are neuropsychiatrically unifit for Naval Service. The psychologist's mastery of objective testing techniques renders him a valuable aid to the psychiatrist in this task. The psychologist's function, however, is not limited to testing and he has many opportunities for exercising clinical judgment in the usual sense of the term. As Louttit has pointed out, the original directive setting forth the duties of the psychologist in a Psychiatric Unit mentions specifically the necessity of supplementing test scores with clinical interview and the interpretation of social histories.

> It must be remembered that clinical psychological examinations must go beyond the mere securing of numerical scores. Such scores have meaning only insofar as they are interpreted in the light of the examinee's personal reactions, his history, and his attitudes. The psychologists selected for work in the Medical Corps will have had considerable training and experience in interviewing, counselling, the interpretation of social histories, as well as of strictly psychological tests. Therefore, their findings should prove a valuable supplement to those of the psychiatrists (**14**).

A later directive refers to the psychologist as functioning as "an adjunct" to the psychiatrist. Standard dictionary definition of this term ranges from "a person joined to another in some duty or service, colleague, associate," to its use in logic to signify a non-essential quality. As far as I am aware the latter interpretation has never been applied either in theory or in practice to the training station psychologist.

The specific details of the various training station programs have been set forth elsewhere (**2**, **3**, **4**, **11**, **12**, **17**) and there is no need to repeat them here. The directives have wisely allowed for minor individual differences in approaching the general problem of military selection. Certain general problems stand out, however, and are worth notice.

All the present Training Station psychiatric programs emphasize a brief preliminary screening in order that some recruits with possible neuropsychiatric difficulties be isolated for further careful study. In this preliminary screening the psychologist meets his first problem, that of shortening the time consuming standard individual and group tests in order that a great number of men may be tested in a brief space of time. This problem has proved surmountable and it has been possible to construct brief tests of intelligence which meet the demands of rapid administration without too great sacrifice of reliability and validity. Again the solutions have been individual and various, a fact which in itself is extremely encouraging. Both individual and group tests have been evolved which make possible quick but fairly accurate judgments of intelligence in less that 10 minutes (1, 5, 9). The results suggest that such brief instruments may well have an important later contribution in civilian mental hygiene clinics after the war. In such civilian work the cry is often raised that demands are so great that it is impossible to meet them with the available clinical facilities. The assumption, and it is certainly a sound assumption on an idealistic ground, is that such facilities should be expanded. On practical grounds, however, civilian clinics may well be able to copy from the military service and meet some of the problems of demand by streamlining their present techniques.

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* The opinions or assertions contained herein are the private ones of the writer and are not to be construed as official or reflecting the views of the Navy Department or the Naval Service at large.

Once it is decided that a man needs further attention he is given a more careful examination, in most cases while he is being held on an observation ward. Here the psychologist is able to, and should, use the longer techniques of standard practice. Once again the official directives have wisely permitted individual choice in the instruments used. The psychologist will often find this testing more complex and exacting than that of civilian practice. Most of our intelligence tests have been standardized upon large homogeneous groups, too often selected from large, urban, juvenile school populations. In the military situation the psychologist meets the problem of testing *adults*, adults whose cultural and educational background often handicap them in performing adequately on the standard tests. Such special problems as illiteracy, the diagnostic value of test scatter, and attempted malingering will plague the examiner. Experience has shown that these problems can be handled by objective techniques and that the psychologist's training in scientific investigation will enable him to produce creative solutions. (6, 7, 8, 10)

The psychologist is also expected to exercise his talents in the evaluation of temperament and personality. Here he will find even greater need for creative thinking than he will in the field of measuring intelligence. The official directive recognizes the difficulties involved and does not limit the psychologist to specific tests. In practice he will find it necessary to call upon most of the standard techniques of personality testing. Personality inventories and projection tests such as the Rorschach and the Thematic Apperception will all be needed, and the Naval psychologist should be well grounded in them. The special need for research in this field was recognized in the following words from the original directive—"From the very beginning the psychologists should undertake to collect data on such scales which can later be studied in relation to the psychiatric findings and service records for purposes of establishing validity."

Before any man is discharged from the Naval Service his case must be reviewed by an Aptitude Board which consists of a regular line officer, a non-specialist medical officer, two psychiatrists, and a psychologist. In this judicial function the clinical ability of the psychologist receives further recognition and he is allowed to exercise his judgment and to cast his vote on the basis of the total clinical picture and not on the mere test scores.

Electroencephalography has become increasingly important in certain training station diagnostic procedures, especially in the fields of epilepsy and post-traumatic personality disorders (**16**). Psychology has played an important part in the introduction and development of electroencephalography in this country. The psychologist's interest in apparatus and laboratory procedures, particularly those involving electronics made this inevitable. It is only natural that he should become involved in its use in naval psychiatry and in many of the training stations the electroencephalographic work is handled either entirely or in part by the psychologist. The final interpretation, of course, rests with the psychiatrist as it must where a question of medical responsibility is involved.

There have been many other incidental aspects of training station psychiatry with which the psychologist has become identified. His thorough grounding in experimental design and procedures has made him serviceable in research investigations many of which lie outside the strict field of psychology. Moreover, his understanding of and training in statistical procedures has proven of great use.

All in all the activities of the psychological members of any training station psychiatric unit (or one might say the duty of a psychiatric "adjunct") are limited more by the professional training and by the ability and the adaptability of each individual psychologist than they are by official directive. In reading Louttit's analysis of 400 psychologists commissioned in the Naval Service (**13**), it is interesting to note that a larger proportion of the psychologists assigned to training station psychiatric units have PhD's than those assigned to other strictly psychological tasks such as service in the Bureau of Personnel, in Selection work or in Aviation Psychology. To the psychologist entering a psychiatric unit at a training station the Navy offers a great opportunity for clinical experience as well as patriotic service. That these psychologists have filled a definite need is attested to by the steady demand for them.

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THE CLINICAL PSYCHOLOGIST IN A NAVAL HOSPITAL

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The course at Midshipmen's School which has twice as much weight as any other course in determining the future status of the would-be naval officers is Naval Organization. It seems fitting, therefore, to begin a report on the work of a naval clinical psychologist by trying to locate his position in the naval organization. There are seven bureaus in the Navy Department. Hospitals come under the Bureau of Medicine and Surgery. The officers under this bureau fall into five classifications: medical, dental, hospital and nursing corps and the Volunteer Specialists branch of the Naval Reserve. Clinical psychologists are in the last named class and along with many other specialists such as biochemists, physiologists and entomologists are designated H-V(S) for men and W-V(S) (H) for women. They wear the caduceus as their corps insigne.

The naval hospital, like any large hospital, is divided into various services, including neuropsychiatry. The clinical psychologist is a regular member of the staff on this service. Unlike other members of the service, the work of the psychologist is not confined to any one ward. He acts as consultant not only for the neuropsychiatric service but for the whole hospital and occasionally even examines out-patients. Consultation requests are made on the regular forms used for all kinds of consultations. Since most of the medical officers are reserve officers, the number and type of requests each makes, and the use he makes of the psychologist's reports, varies a great deal depending upon his previous training, experience, and personality, as well as upon the particular problems of the Navy.

The types of patients appearing on the neuropsychiatric service of a naval hospital are not essentially different from those found at a civilian psychopathic hospital, except that most of them are relatively young males. For this reason, arterio-sclerotics, seniles, general paretics and involutional melancholias are rare.

The principal problems on the neuropsychiatric service of a naval hospital are more those of diagnosis and disposition than of therapy, although there seems to be more interest in therapy than when the psychologist was first attached to the staff in February 1943. Disposition may consist of return to full duty, return to limited duty, transfer to St. Elizabeths Hospital, discharge from the navy, or return to the brig (in disciplinary cases awaiting court martial). Diagnosis is much more important than in civilian practice because it may determine, or at least influence, the type of discharge and the amount of future compensation. For instance, a patient with a diagnosis of chronic alcoholism will be given a bad conduct discharge, thus jeopardizing his chances of obtaining benefits which may be given other veterans. Another problem not found in civilian hospitals is that of EPTE (Existence Prior to Enlistment). Some diagnoses, such as mental deficiency, are less apt to be considered as acquired in service than others and hence less compensatory. Many patients, especially among the women, make somatic complaints for which no organic cause can be found. If they are diagnosed "No Disease" and given an inaptitude discharge, they cannot claim compensation. If they are diagnosed psychoneurotic (without strong proof that it existed before enlistment and was not aggravated by service), they are given a good medical discharge and are entitled to all benefits. The diagnosis, therefore, becomes a matter of importance to all taxpayers because veterans may start filing claims before they even leave the hospital.

There are always a few feebleminded who manage to get through the Induction Centers and avoid an inaptitude discharge at the Training Schools. When there is a question of adequate intellectual capacity, therefore, the patient is always referred for an intelligence test. Frankly psychotic patients in need of institutional care are usually sent to St. Elizabeths Hospital before they are seen by a psychologist. The vast majority of patients seen by the psychologist are borderline mental cases including many anxiety neuroses, hysterias and psychopathic personalities. Some have developed their present conditions after heavy combat duty; others have blossomed forth as early as during the train ride to Boot Camp. Since personality and emotional adjustment are often more important than intelligence in judging the ability of the man or woman to adjust to military life, the Rorschach is frequently requested.

Simple achievement tests such as reading and spelling are sometimes given. Since the Navy has taken draftees, illiteracy is not always ruled out at the Induction Center. Here, as in civilian clinics, an occasional man is found who is intelligent enough and has attended school for a number of years, but cannot read. Since women are required to take a written aptitude test before they are accepted, no feebleminded or illiterate women have been referred for examination as yet. Incidentally, since women do not have the threat of being drafted into the Army if discharged from the Navy, or the same social pressure to be in uniform as the men, they are less hesitant than the men about trying to get out of the Navy via the psychiatric service if they find the military life interfering with their personal liberties and pleasures.

Occasionally the case referred is one in which there is a question of mental deterioration or inadequate mental functioning. This is especially true of cases with organic brain damage. For instance, one man a high school graduate, was referred from neuro-surgery with a large piece of shrapnel in his head. Although his vocabulary was still above average and he could use a pencil, he could not write very much because he could not remember how to spell. He had also forgotten most of his arithmetic. With a little daily help, he was able to make remarkable progress in relearning.

Thus, it is seen, the examinations given by the clinical psychologist in a Naval hospital consist of intelligence tests, achievement tests, personality tests and tests for mental functioning, much the same as in civilian hospitals. There are also staff conferences to attend. These differ from civilian conferences in so far as the military disposition, as discussed above, is an important factor. At the writer's hospital, the psychologist has had some teaching duties. These have consisted of giving an intensive two months training to WAVE Ensigns who have an under-graduate major in psychology but little or no graduate work or experience. Recently a three months course has been started for Navy physicians who wish to work in neuropsychiatry. The psychologist gives three of the daily lectures in this course and 24 lectures in the course for Occupational Therapists.

As described so far, the clinical and teaching duties of the Naval clinical psychologist are not very different from those of any large university hospital. There are, however, certain purely military duties. For members of the Woman's Reserve, these are probably more numerous than those required of the men, for instance, standing 24 hour watches at the WAVE Barracks in addition to other duties. Before WAVE officers were assigned to duty at the Barracks, the other WAVE officers on the station had to be Officer-of-the-Day about every three weeks. That meant being on duty from 8:00 one morning until 4:30 the next afternoon. Now the OOD duty usually comes only on occasional week-ends. At some hospitals, however, where there are few women officers, it may come every few days. Military discipline is exercised over all enlisted women who come under the cognizance of the officers. This consists primarily in such things as enforcing uniform regulations and military courtesy. Since the men, especially un-indoctrinated staff officers, are inclined to be very lenient with the women under their jurisdiction, there is more disciplining to be done by the women officers than would otherwise be necessary.

A final duty of the psychologist is to interview all women on the neuropsychiatric service who are being discharged from the service. Previously, when women were given inaptitude discharges from the hospital, this included collecting the Navy insignia, buttons and hats before the patient left the hospital. Now, since only medical discharges are being given to women at the hospital, it is not necessary to make any such collections. The women are seen, however, in an attempt to have them leave the service with definite plans for the future, and to assure as desirable an attitude toward the service as possible.

In general, it may be said that the psychologist's duties in the Naval hospital are much the same as in a civilian hospital. Exceptions to this result from (1) the preponderantly young adult male population, (2) the military characteristics of the disposition of cases, and (3) the necessary additional military administrative work.

PSYCHOLOGIST IN THE NAVAL HOSPITAL

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Louttit's recent article (1) on placement of psychologists in various branches and activities of the Navy showed that a few were assigned to Naval Hospitals. All these were of the H-V(S) or W-V(S)H USNR classes—attached, that is, to the Medical Department. To my knowledge assignment of psychologists has been made to hospitals only within the continental United States.

My understanding of the activities of psychologists at Naval Hospitals derives almost entirely from personal experience while on duty at the USNH, Mare Island, California. There are few directives or precedents established which serve to limit or define the functions of such psychologists. It may be said, I think, that their duties are essentially clinical and associated for the most part with the work of the neuropsychiatric service of the hospital. This work is principally the evaluation and disposition of neuropsychiatric cases. Functioning as a consultant to the psychiatrists who act as ward medical officers, the psychologist renders service largely by request; he has few routine duties.

In any Naval Hospital it is necessary to appraise all neuropsychiatric cases in terms of potentiality for further adjustment to the service. In some cases, therapeutic procedures might be indicated. In others the only possible disposition may be discharge from the service. In all cases, however, longitudinal study of the individual case is required in order to interpret correctly the facts pertinent to the current admission to the hospital.

A measure of mental capacity is important in any case of maladjustment to naval service. When mental deficiency cannot be ruled out by reviewing the patient's history, a test such as the Otis will show quickly that the man's capacity is adequate, or that he needs more individualized psychometric study. The diagnosis of mental deficiency cannot be made on the basis of a group test; individualized study is a requisite to rule out illiteracy, verbal deficiency, or motivational factors. Simple mental deficiency is, of course, disqualifying for naval service, and in such cases the results of the psychologist's measures are important in confirming the history of maladjustment in establishing the diagnosis.

Recognizing inconsistencies in pattern in tests of mental capacity often suggests the possibility of intellectual deterioration and the need for further study to detect psychotic or organic factors. In such follow-up, the Shipley-Hartford Retreat Scale is useful, but, because for the Navy it is pitched at a fairly high intellectual level, a more frequently useful index is the comparison of the performance on the block designs and on the verbally administered vocabulary or information tests. In our hospital, the Rorschach was always used where deterioration was suspected (as well as to get at psychoneurotic factors), and it usually served to emphasize either an organic or psychotic trend. In cases where psychosis was suspected, particularly at the lower intellectual levels, the Healy Pictorial Completion II, used qualitatively, often led to highly interesting clinical findings, particularly regarding the patient's logic in selecting bizarre objects to complete the pictures.

Ruling out mental deficiency, psychosis and organic factors, with the psychoneurotics the problem was usually one of detecting anxiety, and of evaluating hysterical or compulsive tendencies. Here the Rorschach and the other projective devices were highly useful, and for purposes of laying a groundwork for interview the Minnesota Multiphasic Personality Inventory proved valuable.

It would be erroneous to infer from these brief comments about tests that the psychologist's task is limited to psychometrics. The psychometric picture alone, no matter how well it is interpreted, is insufficient to present any case completely, and although it is the task of the psychiatrist, rather than the psychologist, to evaluate symptoms and psychogenesis, he is usually grateful to the psychologist for any clinical material the latter may provide. One must have the facts about epileptic seizures, for example, or a record of instances of sexual deviation, in order to substantiate the proper diagnosis.

Psychologists in civilian life may wonder whether in the naval service the nature of psychological practice is essentially different. A Naval Hospital such as that at Mare Island is not greatly comparable to a civilian hospital in that the roster of patients there included not only psychotic and severely neurotic patients, but many psychopathic cases which are found, in civil life, more frequently in courts and penal institutions than in hospitals.

Considering the limitations in age range and the predominance of male patients, the problems to be met in naval service are similar to those met in civilian practice. Obviously, because of combat, there are greater numbers of cases in which a catastrophic incident precipitated the current admission to the hospital, but I do not feel that *psychologically* these cases differ from the traumatic neuroses of peace time. I feel further that emphasis on this point is highly important to the patient therapeutically in minimizing the "service-connected" concept in his thinking.

The exigencies of military life aside from combat undoubtedly prodice a greater frequency of cases such as severe homesickness and sexual deviation, and reveal instances of maladjustment to military life traceable to rigidity of the personality.

In addition to clinical evaluation of neuropsychiatric cases, the psychologist may have incidental personnel functions, such as testing of staff, administration of tests qualifying for submarine duty, or of the Navy's General Classification Test for eligibility for special training. Recently the hospital at Mare Island has emphasized a program of re-education of battle casualties where one or more limbs are lost. The psychologist has been consulted in these cases for purposes of evaluating aptitudes and vocational interests.

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PSYCHOLOGICAL ACTIVITIES AT THE UNITED STATES COAST GUARD ACADEMY

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I. DEVELOPMENT

Program. A combined medical and psychological program in which psychologists play an integral role has been developed at the United States Coast Guard Academy (2). This activity appears to be the first integrated and systematic combined medical and psychological program of its kind to be developed at any military academy in the United States. It has certain unique features in connection with the methods utilized for the evaluation of officer candidates. The program originated with the following functions in view:

a. To assist in the selection of suitable officer candidates,

b. To teach Coast Guard Cadets such understanding of human behavior as would be applicable to personnel problems, and

c. To develop skills in officers which would aid them in the evaluation of their men.

The program has developed mainly around the functions of evaluating two groups of officer candidates:

a. Regular Cadets, preparing for a career as officers in the Coast Guard, and
b. Candidates for commissions as Reserve officers.

The latter group contains both men and women. Recently, the Reserve Training School (training male candidates for Reserve commissions) has been discontinued, and an Officers' Training School (advanced work for commissioned officers) has been established. This has added to the program the function of aiding in the evaluation of commissioned officers. The combined medical and psychological program has also been concerned with all other personnel stationed at the Academy (officers and enlisted men) and their families.

II. RELATIONSHIP OF PSYCHOLOGISTS TO ACADEMY ORGANIZATION

Rear Admiral James Pine, U.S.C.G., Superintendent of the Academy, and his staff have been extremely understanding and cooperative with regard to the combined medical and psychological program. Administratively, the psychologists are in the Medical Department of the Academy, with offices located in the Hospital, and are directly responsible to the Senior Medical Officer. Thus, the work of the psychologists is integrated with that of the psychiatrists and other members of the Medical Department. The whole program is carried out in collaboration with the officers in charge of the training activities.

The organizational arrangements have contributed to the efficiency of the program and to its development on a sound basis. The centralization of the collection and interpretation of medical and psychological data has assured that these data would be rendered intelligible and would be utilized. Such an organization has also made possible a completely professional program with qualified psychiatrists and psychologists performing all aspects of the work. Since the combined medical and psychological program is part of the Medical Department's functions, health records and other relevant medical data are available. The research and statistical work necessary for the development of the program is carried out by the psychologists and psychiatrists. It may be seen that all of the program's personnel have intimate knowledge of all its phases.

III. DUTIES OF PSYCHOLOGISTS

The evaluation of officers and officer candidates is built around two fundamental procedures: (a) psychological measurements and (b) interviews. There has been time for only a relatively small number of commissioned officers to report for training at the Officers' Training School. However, over four thousand officer candidates have been evaluated in the combined medical and psychological program. The majority of these have been male candidates for Reserve commissions, while female (SPAR) Reserve officer candidates furnish the second largest number. The Regular Cadets constitute the smallest number. The procedures of evaluation are undergoing a continuous process of development and refinement. In addition to the evaluation of officers and officer candidates, other areas such as counseling, psychotherapy, individual testing, fulfilling special assignments, and conducting discussions on psychological topics are covered by the combined medical and psychological program.

Test Administration. A battery of psychological measuring instruments was developed on the basis of analysis of the requirements of the various training programs.* The battery administered to male candidates for Reserve commissions consisted of the following:

a. a measure of scholastic ability, which yields separate scores for quantitative and verbal abilities;

b. a measure of ability to perceive two-dimensional spatial relations;

c. a vocabulary test;

d. an adjustment inventory, measuring home, health, social, emotional, and occupational adjustment;

e. a vocational interest schedule;

f. a Personal Data Questionnaire (developed by Senior Surgeon R. H. Felix) designed to obtain information on the candidate's family background, health history, psychological condition, educational experience and attainments, occupational experience, recreational and leisure time activities and some self-evaluations of ability and personality characteristics; and

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* Names of tests will be furnished to authorized persons upon request.

g. the group Rorschach Test administered in collaboration with Surgeon D. C. Cameron.*

The same battery of tests is administered to SPAR officer candidates, except that the test on spatial relationships is omitted.

The Regular Cadets receive the same test battery as the male Reserve officer candidates, with the following additions:

a. a test of scientific aptitude,

b. a test of ability to perceive tri-dimensional spatial relationships, measuring some aspects of engineering abilities,

c. achievement tests in the fields of mathematics, natural sciences, and social sciences, and

d. more detailed measures of personality characteristics.

As a basic battery, the commissioned officers receive:

a. the scholastic ability test;

b. the two-dimensional spatial perception test;

c. achievement tests in the basic fields of Communications, Gunnery, Seamanship, and Navigation;†

d. a personality test; and

e. a version of the Personal Data Questionnaire especially adapted for officers.

Interviewing. Officer candidates are interviewed independently by a psychologist and by a psychiatrist. This furnishes independent judgments of the individual from two related but somewhat different points of view. Interviewing time varies from about ten to twenty minutes, depending upon the kind of candidates. The interview is performed with the Personal Data Questionnaire and all test scores at hand. The purpose of the interview is to evaluate the candidate's officer-like qualities, leadership, adjustment, and abilities; and to interpret his test scores. An attempt is made to appraise such characteristics as physical appearance, bearing, forcefulness, poise, animation, thought organization, verbal facility, relevant attitudes and interests, tact, emotional stability, social adjustment, and psychoneurotic traits. On the basis of the interview findings and test data the interviewer prepares a written summary of his evaluations and interpretations, and assigns an overall numerical rating. The ratings range from a low of 1 to a high of 5, and intermediate pluses and minuses are used. Officers, in contrast to officer candidates, receive only one interview of 20 to 30 minutes duration by either a psychologist or psychiatrist.

Research and Test Construction. In developing the various batteries of tests, commercially available tests were used whenever possible, since this was the most practicable approach. Immediately useful results were needed so that measuring instruments of known characteristics were utilized. It has been necessary to conduct normative studies on these tests. Statistical studies of the validity of the tests have constituted a major aspect of the research. Item analyses and correlational studies are in progress, using such criteria as final overall standing, adaptability, and academic records. Probability tables have been developed on the basis of the psychological data to show chances of overall success or failure of candidates during training. It is hoped that the psychological measures may also be validated against the behavior and efficiency of the men in the fulfillment of their duties as officers. Research is being performed on the reliability of the interview as it is used in the combined medical and psychological program.

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* Dr. Cameron is conducting the analysis of the Rorschach Test results.

† These tests are based on items furnished by appropriate Academy Departments.

It is to be expected that some measuring instruments will be developed on the basis of the research outlined above. At present, the writers have constructed a vocabulary test for superior adults. A series of rating scales has been devised to aid training officers in reporting their interviews and adaptability judgments. An individual personality test has been adapted for group administration, and aid has been given in the various revisions of the Personal Data Questionnaire.

Counseling, Psychotherapy, and Individual Testing. Subsequent to the interview, as many as half of the persons in a class return individually to request information concerning their test scores, as well as for counseling or psychotherapy. A good deal of interest is displayed in the meaning of the test scores in relation to Service and post war adjustment. Requests for discussions of post war vocational selection, adjustment and education are quite frequent, but in-Service vocational adjustment is also considered. Problems of personality and marital adjustment receive considerable attention. Psychotherapy may be instituted for those individuals who display emotional tensions due to the pressures of the training program or to disturbing factors outside the Academy.

In addition to the individuals in training, the officers and enlisted men stationed at the Academy and the families of these personnel receive counseling and psychotherapy. Typically, problems of personality and marital adjustment, as well as the behavior problems or school adjustment problems of children, are given attention. Some of these individuals are referred to the psychologists by the physicians for psychological diagnosis, and in these cases many types of individual tests may be utilized. The psychologists are also asked to furnish information on the intelligence level, capabilities, and emotional stability of enlisted personnel whose suitability for continuation in the Service is under question.

In a good deal of the counseling and psychotherapy the psychologists work closely with the psychiatrists. This procedure is to be recommended, since it brings to bear on these problems the combined efforts of men trained in the two disciplines most closely related to such work.

Special Assignments. The officers in charge of the training programs may make requests for special services at any time. Such requests may be for data covering a particular class, for the comparison of several classes, for special studies of particular individuals, for statistical aid or advice, and for the preparation or aid in the preparation of special measuring instruments.

Discussion of Psychological Topics. The Regular Cadets or the officers in charge of the various training programs may request the psychologists to conduct group discussions or to lecture on such topics as are deemed relevant to the group involved.

The extensive character of the psychologists' activities in the combined medical and psychological program may be contrasted to the more specialized type of work demanded of psychologists in some of the other military units. Using the proposed "divisional organization of the reconstituted APA" (1) the psychologists are engaged in work falling in at least the following divisions: (a) Evaluation and Measurement, (b) Personality and Social Psychology, (c) Abnormal Psychology and Psychotherapy, (d) Clinical Psychology, (e) Educational Psychology, (f) Personnel and Guidance Psychology, and (g) Military Psychology. If the inter-related fields of Clinical Psychology, Evaluation and Measurement were defined broadly, these fields might cover the activities.

IV. PREDICTIVE VALUE OF PSYCHOLOGICAL MEASURES

Methods of Analyzing Data. Data are to be presented on the prognostic efficiency of (a) the interview ratings, (b) the combined scores on the tests of quantitative ability, verbal ability, and bi-dimensional spatial perception, and (c) the combined scores on the interview and the tests just enumerated. While the other tests mentioned previously will not be discussed, they are indirectly involved, since they are reflected in the interview ratings. The degree of success or failure during training in the Reserve Training School was used as the criterion against which the predictive value of the measures was checked. Achievement is measured in terms of both academic and adaptability records, and final class standing takes both of these factors into consideration.

Seven classes (about 1,900 cases) of male candidates for Reserve commissions were used in the study. These consisted of four consecutive classes who entered training between June and September, 1943, and three consecutive classes who entered training between November, 1943 and February, 1944. It is important to point out that the candidates were screened by the entrance requirements of the Reserve Training School. Civilians were required to have a college degree and six hours in mathematics, while enlisted men had to pass an ability test. This screening resulted in male candidates for Reserve commissions who were quite homogeneous with respect to scholastic abilities. They made a considerably higher average on the scholastic ability test than did male college freshmen, and the difference is highly significant. This increased the difficulties of differentiating between the men in order to predict probable performance during training. All of the candidates were given training in the Reserve School, regardless of the findings of the medical and psychological personnel. This furnished complete data for the study of the prognostic significance of the psychological measures used in the program.

Norms for the test scores and interview ratings were developed on the basis of the performance of the first five classes to attend the Reserve Training School in 1943 (about 1,350 cases). This group was considered typical of satisfactory Reserve officer candidate material. Using these norms, the test scores and interview ratings have been converted to T-scores so that they could be conveniently compared and combined. T-scores on the three ability tests were averaged, and the resulting scores were arranged in deciles (called ability deciles) based on the seven classes which are the subjects of the present study. The T-scores on the two interview ratings were averaged, and arranged in deciles (called interview deciles) on a similar basis. To combine the ability test scores and the interview ratings, the T-scores on the three ability tests and the two interview ratings were averaged and similarly arranged in deciles (called interview-ability deciles).*

In order to determine the predictive value of the measures, the officer candidates were classified into four groups on the basis of their achievement in the training school: (a) the upper 15 per cent of the entire group in terms of final class standing; (b) all other successful candidates (called the Remaining Successful Group); (c) the Total Successful Group (group a plus group b); and (d) the Failures. Each of the ability deciles, the interview deciles, and the interview-ability deciles has been broken down to indicate the percentage of each of the achievement groups which it contains.

Results. The composition of each of the deciles based on the average T-scores of the interview-ability measures is shown in Figure 1. There is a direct relationship between standing on the combined interview-

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* In some cases where it was administratively impossible to have more than one interview, it was assumed that a second interview would have been the same, thus giving the interviews the same weight for all cases in determining averages. A study of the agreement between interviewers will be published later.

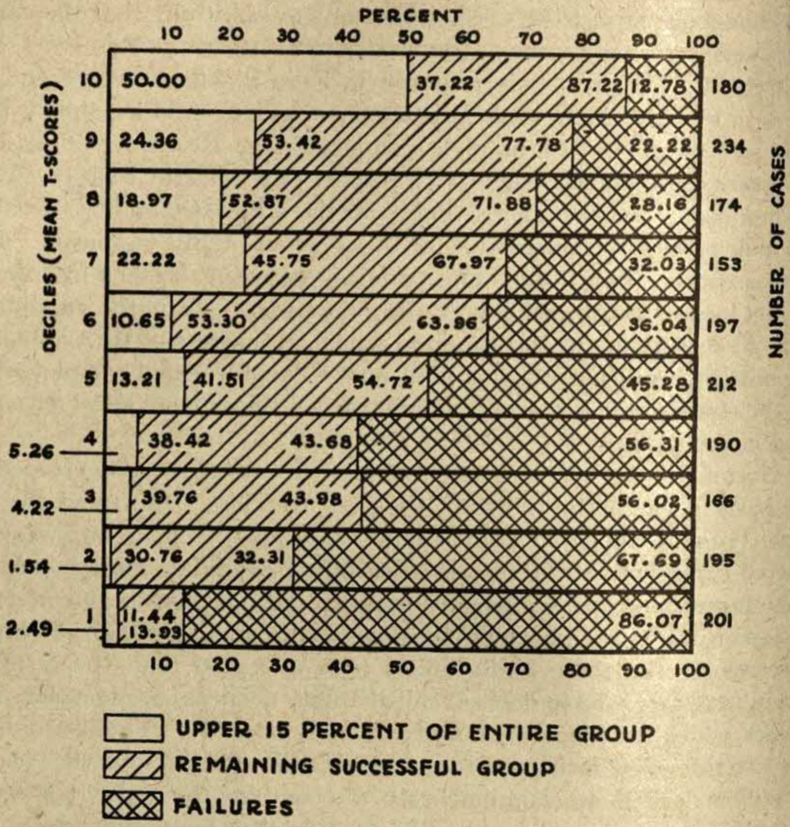

FIG. 1. FINAL ACHIEVEMENT LEVEL OF INDIVIDUALS OF EACH INTERVIEW-ABILITY DECILE, T-SCORE MEAN OF INTERVIEWS AND ABILITY TESTS, 1,902 CASES.

Numbers in the differentiated areas show the percentage of the individuals in a given interview-ability decile who fell in the four groups based on achievement in the Reserve Training School. The first number in the single hatched areas represents the percentage for the Remaining Successful Group only. The second number in these areas represents the Total Successful Group (upper 15 per cent of entire group plus the Remaining Successful Group). The T-scores are based on the norms for male Reserve officer candidates. The deciles are based upon the subjects of the present study.

ability measures and the achievement attained in the Reserve Training School.

Figure 2 compares standing on interview ratings with the final achievement level of the officer candidates. The two lowest deciles are combined in this figure, due to the piling up of scores in the lower end of the distribution of interview ratings. The direct relationship between interview ratings and final class standing is clear. This rela-

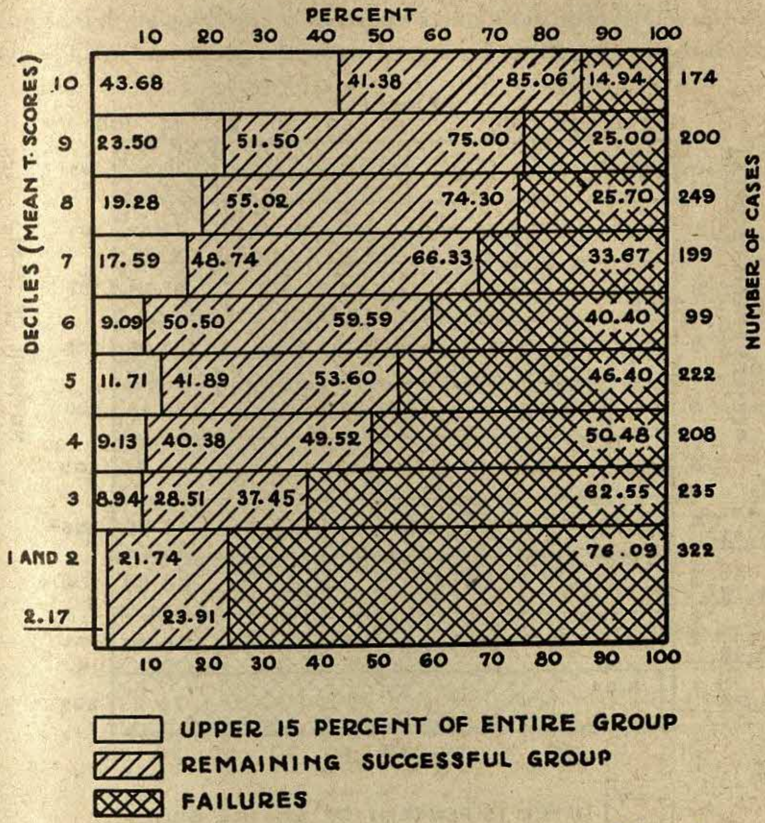

FIG. 2. FINAL ACHIEVEMENT LEVEL OF INDIVIDUALS OF EACH INTERVIEW DECILE, T-SCORE MEAN OF INTERVIEWS, 1,908 CASES.

Numbers in the differentiated areas show the percentage of the individuals in a given interview decile who fell in the four groups based on achievement in the Reserve Training School. The first number in the single hatched areas represents the percentage for the Remaining Successful Group only. The second number in these areas represents the Total Successful Group (upper 15 per cent of entire group plus the Remaining Successful Group). The T-scores are based on the norms for male Reserve officer candidates. The deciles are based upon the subjects of the present study.

tionship is fairly comparable to that obtained between the combined interview-ability measures and achievement, but the relationship between the combined scores and achievement looks somewhat more satisfactory. It should be remembered, however, that the interview predictions could not have been made as well without the ability test scores.

The direct relationship between the final level of achievement of the officer candidates and their mean ability test scores is shown in Figure 3. While the relationship is clear-cut, it is not quite as satisfactory as the relationships obtained when the predictions are based on the combined interview-ability scores, or upon the interview ratings alone.

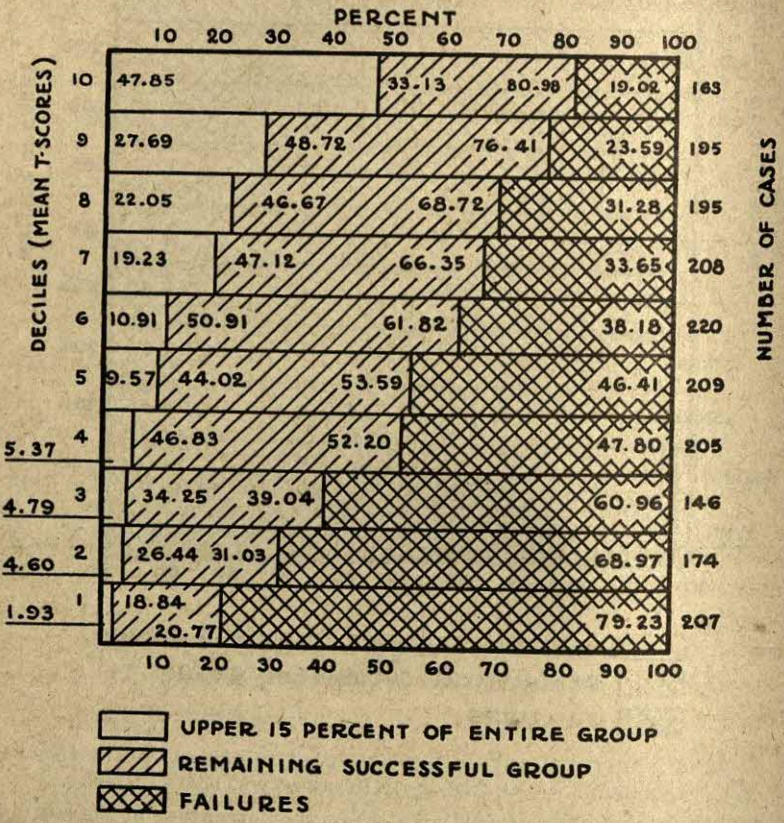

FIG. 3. FINAL ACHIEVEMENT LEVEL OF INDIVIDUALS OF EACH ABILITY DECILE, T-SCORE MEAN OF ABILITY TESTS, 1922 CASES.

Numbers in the differentiated areas show the percentage of the individuals in a given ability decile who fell in the four groups based on achievement in the Reserve Training School. The first number in the single hatched areas represents the percentage for the Remaining Successful Group only. The second number in these areas represents the Total Successful Group (upper 15 per cent of entire group plus the Remaining Successful Group). The T-scores are based on the norms for male Reserve officer candidates. The deciles are based upon the subjects of the present study.

Another method of showing the predictive efficiency of the psychological measures is to indicate how the achievement groups are distributed by these measures. Table I deals with the following achievement groups: (a) the upper 15% of the entire group; (b) all successful candidates; and (c) the failures. Beginning at the lower end of the interview-ability deciles, this table shows the percentage of each of these groups which falls at and below each decile level. It may be noted that a considerably higher proportion of the failures than of the successful candidates fall in the lower interview-ability deciles.

TABLE I

EFFICIENCY OF COMBINED INTERVIEW-ABILITY SCORES IN PREDICTING ACHIEVEMENT

Decile	*Cumulative Per Cent Top 15 Per Cent*	*Cumulative Per Cent Successful*	*Cumulative Per Cent Failures*
1	1.74	2.65	20.47
2 and below	2.78	8.61	36.09
3 and below	5.21	15.52	47.10
4 and below	8.68	23.37	59.76
5 and below	18.40	34.34	71.12
6 and below	25.69	46.26	79.53
7 and below	37.50	56.10	85.33
8 and below	48.96	67.93	91.12
9 and below	68.75	85.15	97.28
10 and below	100.00	100.00	100.00

Table II indicates the percentage of each of the three achievement groups which falls at and below a given interview decile. A higher proportion of failures than of successful candidates falls in the lower decile levels. The percentage of each of the achievement groups which falls at and below a given ability decile may be seen in Table III. Again, there is a proportionately higher number of failures in the lower deciles than there are successful men.

TABLE II

EFFICIENCY OF INTERVIEW RATINGS IN PREDICTING ACHIEVEMENT

Decile	*Cumulative Per Cent Top 15 Per Cent*	*Cumulative Per Cent Successful*	*Cumulative Per Cent Failures*
2 and below	2.43	7.26	28.93
3 and below	9.72	15.55	46.28
4 and below	16.32	25.26	58.69
5 and below	25.35	36.48	70.84
6 and below	28.47	42.04	75.56
7 and below	40.62	54.48	83.47
8 and below	57.29	71.91	91.03
9 and below	73.61	86.05	96.93
10 and below	100.00	100.00	100.00

A comparison of Tables I, II, and III indicates that the combined interview-ability scores are somewhat more efficient in detecting failures than either the average interview ratings or the average ability scores are separately. The interview ratings and the ability scores show fairly comparable results as far as the prediction of achievement is concerned.

TABLE III

EFFICIENCY OF ABILITY TEST SCORES IN PREDICTING ACHIEVEMENT

Docile	*Cumulative Per Cent Top 15 Per Cent*	*Cumulative Per Cent Successful*	*Cumulative Per Cent Failures*
1	1.38	4.05	19.07
2 and below	4.15	9.13	33.02
3 and below	6.57	14.50	43.37
4 and below	10.38	24.58	54.77
5 and below	17.30	35.12	66.05
6 and below	25.61	47.93	75.81
7 and below	39.45	60.92	83.95
8 and below	54.33	73.54	91.05
9 and below	73.01	87.57	96.40
10 and below	100.00	100.00	100.00

Discussion of Results. It is clear that the ability tests and interview ratings utilized in the combined medical and psychological program furnish accurate and useful predictions of probable success and failure in the Reserve Training School. These results enlarge upon and in general substantiate data presented in a preliminary report (2). Certain inter-related factors made the results possible. Most of the officer candidates were highly motivated, the course was a relatively difficult one, and the time for study was a good deal more uniform than is the case in most colleges. This combination of factors meant that relative capabilities became very important. In addition, the grading and the adaptability rating of the men was carefully done by the personnel of the Reserve Training School, thus furnishing adequate criteria. Separate assessments were made of academic achievement and adaptability (officer-suitability). Thus, personality characteristics and emotional stability as well as academic abilities were of importance in determining the candidate's achievement. Adequate analyses were made of the ability and personality characteristics necessary for success in the Reserve Training School, and the methods used were successful in measuring these characteristics.

The fact that the combined interview-ability scores are somewhat better than either of the measures alone indicates that, in some cases, the interview ratings act as a corrective for the test scores. The interviewer can consider personality characteristics and emotional stability together with the test scores. He can rate down men with high abilities, or can give higher ratings to men than do the test scores. It is also possible, of course, to give high ratings to high ability men and low ratings to low ability men when the interview findings warrant doing so.

It should be pointed out that the findings of the medical and psychological personnel were available only to the Superintendent, the officer in charge of Reserve Training and his assistant. Only those men who did poorly in academic work or adaptability were considered by the Reserve Training Administration as possibilities for failure.

V. SUMMARY

A combined medical and psychological program in which psychologists play an integral role has been developed at the United States Coast Guard Academy. The program deals with the evaluation of officers and officer candidates, and the furnishing of such services as counseling and psychotherapy to personnel stationed at the Academy. Duties of the psychologists include (a) test administration, (b) interviewing, (c) research and test construction, (d) counseling, psychotherapy, and individual testing, (e) fulfilling special assignments, and (f) discussing psychological topics.

It has been found that the interview ratings and ability test scores give accurate and useful predictions of probable success and failure of male Reserve officer candidates, in spite of the relatively high and homogeneous abilities of this group. When the interview ratings and ability test scores are combined, they furnish somewhat better predictions than either does separately. The results are interpreted.

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PROCEEDINGS OF THE FIFTEENTH ANNUAL MEETING OF THE EASTERN PSYCHOLOGICAL ASSOCIATION

THEODORA M. ABEL, SECRETARY, LETCHWORTH VILLAGE

The fifteenth annual meeting of the Eastern Psychological Association was held at the College of Business Administration, Boston University, Boston, Mass., April 8, 1944, under the auspices of the Psychology Department of the University. Professor Wayland Vaughan acted as local chairman on arrangements. In December 1943, the membership voted by mail ballot to cancel the regular two-day annual meeting and the business meeting and to substitute instead a symposium pertaining to war problems. The membership also voted to grant the Board of Directors emergency powers for the duration of the war. Attendance at the symposium was 140; 80 members, 20 applicants for membership, and 40 guests. Income for the year amounted to $673.50, total expenses were $508.50, leaving a surplus of $165.00.

The Program Committee planned two sessions for the one-day meeting, an afternoon session devoted to a symposium on rehabilitation after the war, and an evening session consisting of a panel discussion of the training of clinical psychologists. Various individuals known to be working on post-war problems were invited to prepare thirty-minute papers on their particular interests for the symposium and to contribute their point of view toward the topic of the panel discussion. It was planned to have six contributors to the symposium on *Demobilization and After*, but only four papers were presented during the afternoon. The paper by Stanley G. Estes of Northeastern University, on *The Training of Personnel Psychologists* was transferred to the evening session since it fell rightly in the topic of the panel discussion. As time was getting short, Donald G. Marquis of Yale University, very considerately withdrew his paper on *Rehabilitation and Counseling for the Returning Soldier*, so as to allow time for the presidential address.

Edna Heidbreder, of Wellesley College, delivered the presidential address at the termination of the symposium. Her topic was *Toward a Dynamic Psychology of Cognition*. She presented a very clear hypothesis for a functional approach to the cognitive processes, an approach which marked no Aristotelian cleavage between perception and thinking but rather explained the emergence of cognitive reactions from the more basic perception of objects. Experimental data were given which added considerable weight to the point of view outlined. Essential as are our more immediate war and post-war problems and expediencies, this presidential address was indeed a real contribution to the field of scientific psychology and logical thought.

Elections and appointments: Officers were elected to serve as follows:

President, Henry E. Garrett, Columbia University, 1944–45; *Treasurer*, Lyle H. Lanier, Vassar College, 1944–47; *Directors*, Edna Heidbreder, Wellesley College, and Anne Anastasi, Queens College, 1944–47, and *Director*, 1944–46, to fill the unexpired term of Henry E. Garrett, Carroll C. Pratt, Rutgers University. The Board of Directors appointed, as chairman of the Program Committee for 1944–45, J. McV. Hunt, Brown University; and as Representative on the Council of the American Association for the Advancement of Science, Elaine F. Kinder, Rockland State Hospital, 1944–46; and on the Auditing Committee, Gardner Murphy and Louis Long, College of the City of New York, 1944.

The following actions were taken at the meeting of the Board of Directors acting for the membership:

1. Proceedings of the 1943 meeting as printed in the *Psychological Bulletin* were accepted.
2. The reports of the Secretary and of the Treasurer were accepted and a budget totalling $675.00 was adopted for the year 1944–45.
3. Seventy-six applicants for membership were taken into the Association.
4. The report of the chairman of the Clearing House on Information relative to job placement showing that among 50 requests for psychologists made during the year, 12 were definitely filled by members of the Association, was accepted.
5. The Board voted to continue for one more year the Clearing House on Information as now constituted, with the secretary of the Association as chairman and with an advisory committee including the Executive Secretary of the Office of Psychological Personnel and three members representing various geographical localities.
6. It was voted to send a letter to Dr. Ernest R. Hilgard, chairman, and the other members of the Joint Constitutional Committee of the Intersociety Conference of the American Psychological Association and the American Association for Applied Psychologists, recommending that the new national psychological association be set up in such a way as to insure representation by regional societies on the Council of the new organization.
7. Since traveling was so restricted this year making it impossible for a large portion of the membership to attend the Boston meeting, it was voted to print abstracts of the papers contributed to the meeting.
8. It was voted to send an offprint of the Proceedings to all members of the Association who are not members or associates of the American Psychological Association and hence do not receive the *Psychological Bulletin* in which the Proceedings are printed.
9. The invitation of Professor Gardner Murphy for the Association to hold its annual meeting in 1945, at the College of the City of New York was accepted with thanks.
10. A vote of thanks was extended to President Marsh, Professor Vaughan and other members of the local committee on arrangements at Boston University for their kind hospitality in arranging for the meeting of the Association this year.

The financial statement for the fiscal year, 1943–44, prepared by the Treasurer and verified by the Auditing Committee, is as follows:

Financial Statement as of May 1, 1944

for the Fiscal Year 1943–1944

Income

Membership Dues		
Dues for the current year (1943–44)	$ 425.00	
Arrears for 1942–43	86.00	
Arrears for 1941–42	29.00	
Applicants' fees	72.00	
Guest fees	36.00	
Interest on Savings Account	25.50	
Total Income		$ 673.50

Expenditures

Publication of 1942–43 *Proceedings*	$ 42.55	
Office of the Secretary	215.75	
Office of the Treasurer	84.40	
Travelling expenses of officers	4.60	
Printing and mimeographing	26.47	
Miscellaneous supplies	11.92	
Postage	85.91	
Refund of dues payments	2.00	
Balance on expenses of 1943 meeting	10.00	
Letters for Goodwin Watson	20.20	
Collection of money orders (bank)	.70	
Registration at Boston meeting	4.00	
Total Expenses		508.50
Surplus for 1943–1944		$ 165.00

Balance Sheet

Cash: Fifth Avenue Bank of N. Y.	$ 849.84	
New York Savings Bank	1291.75	
Petty cash (Secretary)	20.00	
Petty cash (Treasurer)	20.00	
Total Cash		$2181.59
Capital: As of May 1, 1943	2016.59	
Surplus, 1943–1944	165.00	
Total Capital		$2181.59

The Program of the meeting was as follows:

Psychology and the Peace. GARDNER MURPHY, College of the City of New York.

Psychologists failed twenty-five years ago to study the world predicament in psychological terms, and during the 'twenties and 'thirties they failed to study the processes which eventuated again in war. We hope now to do better, contributing a little something to knowledge which may serve to forestall World War III.

First, we are giving attention to problems of inter-cultural understanding, with special reference to the sore spots which develop as a result of differing social frames of reference, misunderstandings of the value systems of others, and unwitting ego injuries. It has become patent in recent months, for example, that anti-British and anti-Russian feeling are related largely to the American ego rather to American economic interests as such. By understanding and clarifying, we may help to mitigate these tensions.

Secondly, we can study psychologically the process of education for world citizenship, as it relates not only to the content of school and college work, but to the experience of the democratic process. International educational planning, providing democratic experiences and a basis for inter-cultural sharing (as exemplified by contemporary leadership research in the Boy Scouts) might do a great deal.

Third, advance in public opinion techniques has made it possible in recent years for executives and diplomats to understand far more clearly than before in what direction the public wants to go. Today, despite the efforts of the isolationist press, it is clear that the great majority of Americans ardently desire international collaboration in the resolute prevention of war. The more closely public opinion is studied, and the more fully the desire for peace is implemented, the safer we shall be; and as the public opinion techniques improve and become more sophisticated and more revealing, they will discover better directives for executives. We are on the threshold of discovering research techniques to study the *world tides of public opinion*, and to integrate the knowledge with democratic policy.

Readjustment of the Returning Serviceman. IRVIN L. CHILD, Yale University·

This paper reports a few of the general points made most frequently or urgently by contributors to a projected publication of the Sub-Committee on a Textbook on Miliary Psychology.

Typical among factors posing problems of readjustment for large numbers of discharged servicemen are the following:

1. The absence of teachers to guide the relearning required.
2. Loss of prestige, responsibility and income suffered on separation, particularly in the case of officers.
3. The inappropriate carry-over into civilian life of habits and attitudes acquired or strengthened in the service, such as emotional dependency, avoidance of initiative, certain specific skills of leadership.
4. Unrealistic attitudes and beliefs about civilian life, such as exaggerated notions of civilian prosperity, over-idealization of satisfactions of normal life in contrast with military hardships, and false expectations based on restricted experience with civilian society during furloughs.
5. Feelings of alienation from and hostility towards civilians, including even close relatives.

Among respects in which the attitudes and knowledge of the general public will be especially important as determiners of good or bad adjustment are the following:

1. Civilians' being set to expect changes in servicemen and therefore to readjust their own behavior.
2. Preparation for resentment in some veterans, and hence for an attitude leading toward conciliation rather than further split.

3. Appreciation of the need of disabled men for reestablishing independence through new skills, rather than for over-assistance which would encourage dependence.

4. Understanding of the meaning of psychiatric bases of discharge, in order to prevent unfair prejudice against men so discharged.

Some Types of Military Psychiatric Casualties and the Problem of Rehabilitation. DAVID SHAKOW, Worcester State Hospital.

The results of a study of 49 mentally disordered soldiers taken from a larger group of 175 who broke down before combat are reported. When the schizophrenics are divided into four classes and comparison made with groups of psychoneurotics and psychopathic personalities it appears that two of the schizophrenic groups and the psychopathic personalities show many similarities and the other two schizophrenic groups and the psychoneurotics are similar within themselves. From the point of view of background characteristics, the first three groups give evidence of poorer adjustment in most spheres, i.e., there is a greater frequency of family neuropsychiatric abnormality, disturbed home conditions and unsocialized personality development. In the military situation, whereas the conditions which seem to play a prominent role in causing breakdown in the psychoneurotic and the two less disturbed schizophrenic groups are either socially oriented or the result of concrete difficulties, in the other three groups these factors seem to be mainly the result of inadequacies of a deep personal nature. With respect to rehabilitation, of 21 cases available for study in this respect 10 had a good outcome (doing as well as before induction, or better) and 11 had poor outcome (either still in the hospital or doing poorly outside). The characteristics which distinguish the groups are in many respects similar to those already mentioned. Good outcome is associated with good previous social adjustment, good previous employment adjustment, cohesive home, evidences of maturity of personality, and in the military situation, nostalgia and worry over relatives. The factors associated with poor prognosis are: poor previous social and employment adjustment, disorganized or demanding home, erratic and hostile personality traits, the use of the army as an escape, a dislike of regimentation and authority and sex difficulty in the army. Psychological studies during hospitalization also revealed similar trends. Because of the relatively minor importance of the vocational factor and the major importance of personality guidance and therapy in these cases, the psychologist's function appears mainly to be the development of techniques for obtaining more objective and accurate anamnestic data and the development and application of personality evaluation devices.

Vocational Guidance Problems of Returning Veterans. CLYDE W. GLEASON, U. S. Veterans' Bureau.

Recent experience with disabled veterans of World War II shows urgent need for more realistic vocational guidance. The best way to reorient our thinking in this vital counseling area is to consider certain outstanding problems being faced by the veteran and those who are trying to help him effect his vocational adjustment.

Where can he find a good counselor? This is not merely his problem, but that of a society which must not wait until the trickle of veterans grows to a torrent. What will be the post-war job opportunities? Are there training opportunities for the more promising vocations? If he is able, is it better for the veteran to get into remunerative war industry now, contribute to the war effort and save money for future investment in training or business, or to select a long-time objective and start preparing now? Should he give principal weight to his long-time vocational problem as such, or greater weight to family responsibilities (present or potential), climatic factors, etc., which might alter or limit his vocational objectives? Should he migrate or limit himself to vocations in the home community? What are the implications of his disabilities? What are his deepest vocational interests and his highest aptitudes? If psychology can groom her professionals to the point of attacking such problems realistically, and bring sound psychological principle and method to bear upon them, she will have met one of the greatest challenges in her history.

PRESIDENTIAL ADDRESS

Toward a Dynamic Psychology of Cognition. **Edna Heidbreder**, Wellesley College.

PANEL DISCUSSION

The Training of Clinical Psychologists as Part of Post-War Planning. Chairman: **Saul Rosenzweig**, Western State Psychiatric Hospital. *Participants:* **Gordon W. Allport**, Harvard University, **Stanley G. Estes**, Northeastern University; **Gardner Murphy**, College of the City of New York; **David Shakow**, Worcester State Hospital.

PROCEEDINGS OF THE TWENTY-FOURTH ANNUAL MEETINGS OF THE WESTERN PSYCHOLOGICAL ASSOCIATION

RALPH H. GUNDLACH,* UNIVERSITY OF WASHINGTON

The Association again this year followed the policy of dispensing with a coast-wide meeting because of the difficulties of travel and accommodation, and encouraged local meetings in the three areas of the Pacific Coast.

In the Northwest, for the second year, no meeting was attempted. The Bay Area had a regional meeting on Saturday, June 17th, at Mills College, Oakland. Dr. Lovisa Wagoner was the local chairman. Approximately 80 persons attended the sessions. Psychologists of the Los Angeles area met on Saturday, July 15th, at the University of California at Los Angeles, with Dr. H. C. Gilhousen as local chairman. About 150 persons attended these sessions.

The officers of the Association still remain: *President,* Jean Walker Macfarlane, Institute of Child Welfare, University of California; *Vice President,* William Griffith, Reed College; *Secretary-Treasurer,* for a three year term, Lester F. Beck, University of Orgeon, at present on leave.

PROGRAM OF THE BAY AREA MEETING

Saturday Morning June 17,

WARNER BROWN, Chairman

The Relative Effectiveness for Immediate Recognition of Sound-Movie Instructional Film Contrasted to a Lecture. RALPH H. GUNDLACH, University of Washington.

The study, made at the request of the First Motion Picture Unit of the Army attempted to measure some of the learning accompanying the presentation of instructional films on airplane flight, and landing; and to measure by the same means, the learning accompanying brief lectures covering the same materials. Under these conditions neither group was statistically superior to the other.

A New Stabilometer for Studying Dynamic Equilibrium in the Standing Position. ROLAND C. TRAVIS, Stanford University.

Purpose: To study a person's ability to maintain balance while standing on an unstable base.

Technique: Unstable platform mounted on an universal joint with extension springs to control difficulty of the task. Hinged stylus, contact target, interrupter and electric counter for recording accuracy of performance. Trials one minute long with rest periods of one minute.

Results: (a) Great individual differences manifested; (b) Fairly high negative "r" between weight and balance score and between height and balance score; (c) Partial "r's" favor weight as important factor; (d) Great variability between individuals in same weight and height groups; (e) Small sex difference in favor of the women; (f) Correlation of .85 between successive trials; (g) Fair "r" between age and balance score, also between weight and age. Partial "r" again favors weight as the important factor.

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* Acting secretary-treasurer, in the absence of L. F. BECK.

The Psychopathic Delinquent: An Interpretation of Some Current Opinions and Indications for Treatment and Segregation. ROBERT B. VAN VORST, Preston School of Industry.

This paper presents a summary and synthesis of some current interpretations regarding the psychopathic delinquent. Consideration is given to the differentiation between the defective and psychopathic delinquent, also between the psychopathic delinquent and the ordinary delinquent, and other abnormal personalities. Illustrative cases show the value of diagnosis as early as possible, as well as the necessity for specialized treatment involving lengthy custodial segregation.

Some Recent Developments in the Aims and Techniques of Opinion Sampling. RALPH GRANNEBERG, OWI.

No abstract available.

Prestige in Music. PAUL R. FARNSWORTH, Stanford University.

The traditional approaches to the study of prestige in music have been through balloting and through the analysis of encyclopedia space devoted to the persons in question. These two methods (analyses of the ballots of school children, of college students and of musicologists; tabulations of space in lay and in musical encyclopedias) have been compared and studied in some detail. Other procedures have been devised which include the tabulations of page mentions and of phonographic recordings.

By the employment of these several methods prestige-changes over the twentieth century have been analyzed. The relations to "time since birth," preference and acquaintance have also been studied.

Spatial Learning and Goal Location. BENBOW F. RITCHIE, University of California.

The first experiment investigated generalization effects in rats which result from 4 days training on one path to food. On the critical trial this path was blocked. The rats were offered 18 new paths radiating in both directions at 10 degree intervals. Of the total group ($N=56$) 36 per cent took the shortest Euclidean path to the original goal location. The others took the remaining paths randomly. The interpretation was that spatial learning involves development of a general readiness to orient towards the physical or Euclidean location of the goal.

The second experiment tested the hypothesis that to learn a two-goal-location problem is more difficult to learn than a single location problem. A maze, shaped like a plus sign, was used, with food boxes at each end of the north-south path. The experimental group was fed in the north box, when started from the east, in the south when from the west. The control group, started from both east and west, was fed in the north on all trials. Only 3 ($N=8$) of the experimentals learned the problem in less than 24 trials; all the controls learned it in less than 8.

Saturday Afternoon, June 17

SYMPOSIUM ON REHABILITATION

JEAN WALKER MACFARLANE, Chairman

In-Service Programs

CAPT. ARTHUR C. JONES, Letterman General Hospital. The problems and program of reconditioning at a receiving hospital.

MAJOR LIPSCHLITZ, Camp Stoneman. Psychiatric problems in a rehabilitation camp.

Problems and Programs as seen by Liason Civilian Organizations.

HELEN PRATHER, Military and Naval Welfare Service, American Red Cross. The major worries and preoccupations of the hospitalized service men, as seen by the psychiatric social worker.

ALICE JOHNSTON, Home Service Division, American Red Cross. The major problems of the service man in relation to his family.

C. V. CARLSON, Acting Vocational Rehabilitation Officer, Veterans' Authority. Problems of rehabilitation as seen by the Veterans' Administration and the program for meeting them.

BARBARA MAYER, United States Employment Service. The problems seen in the process of job placement of mustered out service men.

Discussion led by:

LT. ERIK WRIGHT, Oak Knoll Hospital
LT. WILLIAM MURPHY, Morale Officer, Letterman Hospital
ROGER BARKER, Stanford University
ALAN NELSON, California Bureau of Vocational Rehabilitation
CALVIN P. STONE, Stanford University

PROGRAM OF THE LOS ANGELES MEETING

Saturday Morning, July 15

ROY DORCUS, Chairman

The Explanation of Physical Phenomena Given by White and Negro School Children. **F. NEWELL JONES**, University of Alabama.

Explanations of ten simple physical demonstrations were obtained from 163 Negro and 134 White children, aged 8 to 16 years, in the public schools of a Southern community. These answers were scored for adequacy, and classified according to type of answer, e.g., materialistic, superstitious. Few non-materialistic answers were found, and these were not more numerous among the Negroes. Negroes scored lower in adequacy in many cases, but only a small proportion of these differences were reliable. The data were also analyzed for age trends and sex differences. Various factors contributing to the results obtained, such as educational opportunity, are briefly considered.

V.T.E. in Relation to Discriminanda. EVELYN GENTRY CALDWELL, University of California at Los Angeles.

No abstract available.

A Study of Selected Cases of Aphasia. ELLEN B. SULLIVAN, University of California at Los Angeles.

Cases studied presented serious aphasic symptome resulting from accident or illness. They presented also a known history of satisfactory accomplishment previous to the onset of the difficulty. The objective was to determine the nature and extent of the difficulty and to check the efficacy of specific techniques to improve the aphasic condition. Seven cases were worked with intensively and followed up through the past nine years. Four of these satisfied the objective of this study. Three cases were of a more complicated type but gave information of interest. The four selected cases improved in control of aphasic symptoms and in personal, educational, social and vocational adjustment. The study included a reevaluation of tests and learning materials for aphasic subjects.

The Status of the Image in "Objective" Psychology. FRANK DAVIS, University of California at Los Angeles.

No abstract available.

Some Aspects of Discrimination in a War Area. DOROTHY W. BARUCH.

As labor shortages developed in Southern California, the immigration of Negroes from the South increased enormously. The Negro had looked forward to a land of promise. He found housing unavailable, jobs disappointing, community facilities sparse, discrimination rife. A frequent reaction was one of aggression. His attack called forth counter attack. This spread to embrace other minority peoples.

Racism mounted, nullifying seniority privileges, permitting more open aggression, including renewed activities of the Ku Klux Klan. In spite of manpower shortages, orders still came from industries specifying that no Jews, Negroes or Mexicans would be hired. Teachers in the schools let prejudice create scapegoating in which they themselves took part. Hostility was freely sanctioned. Counter-hostility begot counter-hostility in an unending chain.

Various types of treatment were attempted. Their limitations, and further treatment which might be profitably undertaken, are discussed.

Alleged Binocular Color Mixing. KNIGHT DUNLAP, University of California at Los Angeles.

Five conditions of retinal stimulation were employed: (1) Stimulation of both eyes by red light, (2) Stimulation of both eyes by green light, (3) Stimulaion of one eye by red and the other by green, (4) Stimulation of one eye by red and the other by blue and (5) Stimulation by blue alone. Wratten color filters were used; F29 for red, B48 for green, and C-5 ,47 for blue.

The results show no evidence for binocular mixture, and the apparent mixture of red and green binocularly can be explained by the well known facts of color adaptation, and the fading in saturation of all colors as the intensity of stimulation is increased.

Unorthodox Uses of Personality Tests. HARRY C. STEINMETZ, San Diego State College.

Personality tests may be readily used in the measurement of understanding, compatibility, opinion or attitude, and what may be called either psychological perception of empathetic insight. Such usages were described and illustrated in the foregoing order of emphasis, abilities being indicated by securing, on request, high or low scores in tests of high validity, by emulating modal responses of a group, predicting attitude responses, and responding as another does. Appeal was made for aid in securing data. It was hypothecated that psychological ability may be measured, as for selecting and training clinical psychologists, psychiatric social workers, interviewers and raters, and that some of the concepts of psychophysics are relevant.

A Brief Study of the Humm-Wadsworth Temperament Scale and the Guilford-Martin Personality Inventory in an Industrial Situation. ROY M. DORCUS University of California at Los Angeles.

Two groups of employees selected by management were subjected to these tests. One group contained individuals who were definitely maladjusted or problem cases; the other group contained only individuals who were definitely well adjusted and satisfactory. Production was not taken into consideration. Both groups were given the tests at the same time and the composition of the group was not known in advance. The results indicate that the tests agreed with the ratings of management in approximately 70% of both the desirable and undesirable cases.

The Validity of the Humm-Wadsworth Temperament Scale. DONCASTER G. HUMM.

Two hundred individuals were diagnosed for temperament, each one by two technicians separately, and, in each instance, the diagnoses compared. One hundred and eighty-one of these were to be found in agreement. These subjects were then given the Humm-Wadsworth Temperament Scale. The verified technicians' diagnoses were then compared with the Humm-Wadsworth diagnoses. The product-moments correlations obtained were as follows:

All cases (Number of comparisons = 1,267) . . . . +.85± .005
Cases with acceptable No-counts (Number of comparisons = 728) . . . . +.94± .003

In all cases the total agreement with diagnosis was 87.5 per cent, and the total disagreement, 12.5 per cent. In the cases of acceptable No-count, the total agreement was 91.0 per cent, and the total disagreement was 9.0 per cent.

Counseling Technical Employees. HARRY W. CASE, Douglas Aircraft Co.

Tentative indications concerning the basic types of problems confronting male technical employees have been obtained by a study within the Engineering Division of a large corporation. Statistics concerning the counseling problems were compiled over a three month period and these were capable of classification into categories concerned with: (1) Inter and intra departmental and plant transfers, (2) Simple personal problems, (3) Wages, (4) Courses of study, (5) Employment for other members of family, (6) Wage stabilization program, (7) Selective Service, (8) Associates, (9) Job placement, (10) Job classifications, (11) Availability Certificates, and (12) Psychoneurotic in nature. These appeared capable of segregation into three large groups: Those associated with industrial life; those associated with the individual's non-industrial environment; and those attributable to wartime influences. A tentative and later investigation indicates that the wartime factors may significantly influence and vary the type and number of problems.

Saturday Afternoon, July 15.

COL. J. P. GUILFORD, Chairman.

Reading Disability in the Army. GRACE FERNALD AND PERINA PIZIALI, University of California at Los Angeles.

No abstract available.

Psychological Services in the Army Air Forces. J. P. GUILFORD, LT. COLONEL' Air Corps.

The chief value of psychologists to the Army Air Forces has been their ability to evaluate men at all stages of the training and combat sequence, from induction to separation from military service. Adapting known evaluative procedures and creating new ones have entailed a research program on an enormous scale carried on simultaneously with processing activities.

Psychological procedures for selection and classification of Air Corps personnel and for promoting optimal learning and performance have proven to be extremely valuable. One significant conclusion is that evaluative procedures are best when especially designed for the purpose. This requires continual technical attention to changing requirements of personnel and of their assignments. Development of selective tests and research on training criteria are inseparable if the best results are to be obtained.

The Functions of a Psychological Research Unit in the Army Air Forces. NEIL D. WARREN, Major, Air Corps.

The functions of psychological Research Units of the Army Air Forces have been both experimental and applied. The applied aspects have involved the measurement of aptitudes for aircrew training as pilots, navigators, and bombardiers. The administration of a battery of written and psychomotor tests, weighted appropriately for each type of training, provides information upon which classification is based.

The experimental program includes the development of new tests, investigation of training criteria, studies of training methods, and studies of performance after training. Illustrations of these various problems are drawn from the operation of Psychological Research Unit #3.

A New Item-Analysis Chart. FREDERICK B. DAVIS, Capt., Air Corps.

An item-analysis chart has been developed that provides a rapid means of obtaining both a discrimination index and a difficulty index for most usable test items. These indices have the unique merit of constituting essentially linear scales. The discrimination indices, which are a function of Fisher's z values, range from -100 to $+100$. The difficulty indices, which are directly comparable regardless of the number of choices in the items, run from 1 to 99. Proper adjustments are made to insure the most reasonable treatment of items omitted by subjects as distinguished from items not reached by subjects. There is no necessary relationship between these difficulty indices and the discrimination indices of the corresponding items. Independent information regarding the discriminating power and the difficulty of each item is required to attain maximum efficiency in measurement.

Factor Analysis Findings in the AAF Psychological Program. LLOYD G. HUMPHREYS, Captain, Air Corps.

Several well-known factors have been isolated and utilized in the AAF Psychological Program. These are the Verbal, Numerical, Perceptual, and Inductive Reasoning factors defined by familiar tests.

Three factors have been isolated in the area of spatial thinking. One of these has been termed Visualization, defined by Thurstone's *Punched Holes* and *Surface Development* Tests and a Bennett-type mechanical test. The other two cannot be well differentiated from each other verbally at present. One is best defined by the *Hands* Test; the other by a certain paper and pencil, and psychomotor tests developed in the program. The *Flags* Test and the *Cubes* Test appear on both factors.

Other factors are a Motor Coordination factor and a Mechanical Information factor.

Present evidence indicates that the validity of a test can be adequately expressed as a summation of the validities of its factorial components.

PANEL DISCUSSION

The Psychological Aspects of Motion Pictures Which are Related to the War Effort

FRANKLIN FEARING, Chairman

1. *Methods of evaluation of motion pictures.*
   FLOYD RUCH, University of Southern California.
   MAJOR J. J. GIBSON, Army Air Corps.
2. *Tensional areas in which motion pictures can make a contribution.*
   MAX SILVERSTEIN, Council of Social Agencies, Los Angeles.
   MAJOR BERNARD VORHAUS, First Motion Picture Unit, Army Air Corps.
3. *The motion picture branch of the OWI overseas, and psychological warwarfare.*
   SIDNEY HARMON, OWI, Los Angeles.

BOOK REVIEWS

YERKES, R. M. *Chimpanzees. A laboratory colony.* New Haven: Yale Univ. Press, 1943. Pp. xv+321.

"This is a composite portrait of chimpanzee personality done in terms of behavior" (vii). It is also a history of the Yale Laboratories of Primate Biology at Orange Park, Florida (now the Yerkes Laboratories of Primate Biology). The book brings together and consolidates the important experimental, medical and naturalistic observations on the chimpanzee both from the Yale laboratories as well as from other sources (notably Köhler and Kohts). It is intended for the lay reader as well as for the scientists.

The book is divided into three approximately equal parts which are introduced by a prologue and followed by an epilogue. Part I, containing five chapters, is entitled, *General Description*. Part II, also containing five chapters, is entitled, *Mentality*. And Part III, which has four chapters, is headed, *Care and Feeding*. There are 24 figures and 64 plates which cover a remarkable range of chimpanzee behavior and treatment from parturition to major surgery. A list of 167 selected references and an excellent index complete the volume.

The observations upon which the book is based cover three generations of chimpanzees totalling a "hundred or more" (234) individuals. Many of the subjects were born in captivity and were observed by the author or by members of his staff from the time of birth onward. Seventeen spent all or part of their infancy in the special nursery of the laboratories. From this unequalled experience Professor Yerkes is led to remark, "For the study of forms of behavior similar to, or perhaps identical with, what we know in ourselves as ideational and symbolic processes, imitation, instrumentation, and language, there probably is no existing creature which has so many advantages as the chimpanzee." (5). Or again, "Its strength and intelligence are such that the adult of the species might conceivably be trained to perform some manual labor necessary to human existence, and it might possibly come also to operate human tools and simple machines" (259).

The major contributions which have grown out of his years of unwavering interest in primate research are listed as:

1. the development of the experimental colony to make specimens available for research,
2. the solution of the practical problems of feeding, housing, and health,
3. the accumulation of much general information about chimpanzee structure and behavior,
4. the development of valuable laboratory and colony records, and
5. the publication of more than 200 journal articles, monographs, and books covering the investigation of special topics.

The fields which have been studied include the physical characteristics, growth, the sexual and reproductive cycles, the sensory and perceptual processes, neural correlates of behavior, learning and adaptation, memory and imagination, the use of tools, symbolism, insight and linguistic expression, suggestibility, emotional behavior, social behavior, drug addiction, parasitic control and related problems of health. Nearly all of these are discussed at some length in the present volume. Many are elaborated in detail by illustrations and quotations from the original publications.

The author's position on the question of instinct is of special interest. He does not believe that the concept can be simply swept aside, as for example, by substituting the word "drive" for "instinct." Both man and ape have much instinctive behavior, although the ant may be taken to typify instinct and the ape correspondingly to typify intelligence. We tend on the whole both to underestimate human instinct and to underestimate chimpanzee intelligence.

Learning is divided into five categories or levels, the lowest of which is "modification of motor expression in correspondence with maturation and exercise" (131). Examples in the ape are the coordination of simple acts into behavior patterns, as in grasping, climbing or walking. The other levels of learning are conditioning, trial-and-error learning, directed learning involving imitation and tuition, and ideational learning.

Concerning emotion in the chimpanzee, Professor Yerkes writes as follows: "The young chimpanzee is a lively extravert, active, energetic, impulsive, enthusiastic, sanguine, very sociable, ordinarily good-natured and fairly good-tempered, somewhat mercurial, timid before the unfamiliar, extremely expressive of its continuous flow of feelings and rapidly changing moods" (27). Yet, "an individual which in the first few years of life impresses one as gay, joyous, full of life, friendly, eager for companionship, in the second or third decade may appear independent, aloof, self-centered, serious, and perhaps also short-tempered or irascible" (28).

Much valuable information on the care and treatment of chimpanzees in captivity is given in the third part of the book. We learn that the chimpanzee is an ideal surgical subject and will not pick or irritate a wound in the process of healing, providing it is left unbandaged. The chimpanzee in captivity is more susceptible to respiratory diseases than to any other kind, the death records of the colony showing that ten specimens have succumbed to pneumonia alone, whereas no other single cause has claimed more than two individuals. The volume publishes for the first time the results of strength tests on the chimpanzee (Finch) which lead to the surprising conclusion that the ape is only slightly superior to man in this respect, and not markedly superior as was previously supposed (112).

The approach of the author to his subject is comparative throughout. Parallels to human behavior and to that of the monkey or to lower infrahumans are frequently drawn. The writing is done in a friendly tone and is much enriched by personal reminiscences of chimpanzee behavior which could only have been supplied by Professor Yerkes. Not infrequently there is inserted a bit of worldly philosophy.

The book as a whole is frankly anthropomorphic, although the author with commendable caution states that, "all our definitions must be operational and our descriptions strictly behavioral" (154). One wonders, at times, if he is not indulging in a whimsical dig at the human race when he characterizes the behavior of the female chimpanzee toward the male in terms of "wiles, trickery, or deceitful cunning" (83), or again when he writes that "the female is, chameleon-like, a creature of multiple personality" (85). A prejudice in favor of the chimpanzee as an experimental subject to the exclusion of other organisms both higher and lower seems to permeate the book. To those who know the author, these things will be interpreted simply as expressions of his individuality and enthusiasm.

That this book is a major contribution to the literature of psychology and biology, there can be no question. It represents the culmination of more than 40 years of scientific interest in the anthropoid apes—an interest which began somewhere around 1900 when Professor Yerkes was a graduate student at Harvard, and which has made him today the undisputed world authority upon the behavior of the chimpanzee.

W. N. Kellogg.

Indiana University.

Ackerson, Luton. *Children's behavior problems: Vol. II. Relative importance and relations among traits.* Chicago: University of Chicago Press, 1942. Pp. xx+570.

Volume I of Children's Behavior Problems, titled "Incidence, Genetic, and Intellectual Factors" (1931), examined the frequency of 161 symptoms and problems among 5,000 children examined consecutively at the Illinois Institute for Juvenile Research. The present volume analyzes the association between each of the several traits and each of three composite measures: personality total (sum of all personality problems present in the case history), conduct total (sum of all conduct problems), and number of arrests for misconduct. A large number of interrelationships among traits are also explored.

The author recognizes two possible research approaches: the investigation which proceeds to test an hypothesis (the *ad-hoc* approach), and the study which amasses data to discover what relationships emerge (the exploratory procedure). His procedure is the latter and is based on the argument that, in an area where little research has been done, such a method will be the more profitable. With this assumption statisticians of the Fisherian school will probably disagree, although they might accept the ingenious logic likening the tetrachoric correlation procedure to the control group method of research.

Product-moment, tetrachoric, and biserial correlations are the principal statistical devices used and deserve some comment. The author's statement of purpose includes the usual cautions on causal interpretations of correlation and makes clear that only the amount, not the direction, of causation may be known from correlation analysis. With more candor than is frequently found among psychological researchers, the author explicitly states the conditions under which use of product-moment, biserial, or tetrachoric correlation is valid and points out that certain of these conditions are not satisfied by his data. He justifies the analysis, however, on the grounds "that in our categorical data the departure from strict normality was seldom so great as to invalidate entirely the meaning of our tetrachoric and biserial correlations within the latitude of interpretation of this study" (19). He avoids other measures of association not based on assumption of normality and rectilinearity of regression as lacking "standardized meaning." The author states that he favors the correlation coefficient over such measures of significance of association as the critical ratio and, presumably, chi square because the latter depend upon the size of the sample; he does not recognize that the correlation coefficient likewise may be considered a measure of significance subject to the size of the sample.

Although Dr. Ackerson notes that correlation coefficients are not the final goal of a research procedure, his treatment will probably not satisfy statisticians who distinguish sharply between problems of testing significance and problems of estimation. The discussion includes an adequate consideration of the proper interpretation of the correlation coefficient in terms of alienation, but adds that "correlations greater than .50 are considered 'high' on the basis of their rarity" and that "among negative correlations, those larger than −.20 occurred so infrequently that they may be considered important" (66). Thus, a sound statistical interpretation of correlation between traits is blurred by an interpretation based on frequency of occurrence in a particular study. Such an interpretation has its place, but may be misleading to the many clinical workers who are invited to use the findings of this research (with proper caution) as the basis for diagnoses and predictions in their work with children. The author, further, states his intention to present the tables of intercorrelations with a minimum of comment to be interpreted by each reader from his own background and for his own purposes. It is to be hoped that the psychologists or social workers who make such interpretations in order to improve their clinical practice will be sufficiently experienced with correlation analysis as not to over-interpret degrees of association.

The mass of correlation coefficients (over 1,400 of them), which comprise the majority of tables in the text, will interest the theoretical student of behavior as well as the applied worker. To illustrate the many findings of value to the discerning student of social behavior, a few may be cited. The circumstances of discord between parents and vicious (as distinguished from "immoral") home conditions do not correlate significantly, either with personality total or with conduct total. The circumstance of "immoral home conditions" shows some correlation with police arrest, but not with the personality or conduct criteria. Designation of "psychopathic personality" is more closely associated with the conduct than with the personality criterion. Among girls, the conduct score is more related to the personality score and less to police arrest than is true of boys. Throughout the text the author refrains from extensive interpretation of his data but shows considerable ingenuity in spotting internal evidence for validity of the findings.

Chapters 13 through 60 may be read selectively and in any order. These give the results of correlating selected traits with other items in the total list. Although the author's persistence and ingenuity in tracing out associations have undoubtedly revealed the most important and meaningful relationships, factorial or "pattern" analyses of the interrelationships should be very interesting. However, a complete analysis must wait for improved techniques of matrix multiplication, to reduce the impossible amount of labor involved.

The author is to be highly commended for his clarity of exposition, for his directness in facing issues, and for his honesty in revealing the shortcomings of his material. While the study admittedly reveals nothing concerning the time factor in the development of behavior or the direction of causation in the observed relationships, it succeeds most admirably in providing material for many hypotheses concerning human behavior. In psychology there are few single studies equal to this in the number of direct leads to research which it provides.

DALE B. HARRIS.

University of Minnesota.

GLUECK, SHELDON & GLUECK, ELEANOR. *Criminal careers in retrospect.* New York: The Commonwealth Fund. 1943. Pp. xiv+380.

The present volume is the third in a series of follow-up studies of the careers of 510 offenders who had been inmates of the Massachusetts Reformatory and whose sentences from that institution expired in the year 1921 and 1922.

In the first volume of the series the criminal careers of the half thousand men studied, prior to commitment to the Reformatory, during their terms of incarceration, and during the parole period, and their careers in five years following the Reformatory sentence are given. The second volume, called "Later Criminal Careers," presented the activities of the same group over a second five-year span. The present volume deals with this same group of men during a third five-year period.

Of the 439 survivors of the original group of 510 young criminals more than 90% have been traced in this third five-year study. More than half of these individuals have been personally interviewed, and information about them has been secured from many sources. This information has been used in further developing what the authors call prognostic tables. These tables essentially analyze the factors appearing in the life histories of the young criminals and on the basis of these facts give a quantitative estimate of the likelihood of certain forms of future behavior, based upon characteristics of the individuals when they were first sentenced and the lives these same individuals subsequently lived.

The theory behind prediction tables is just the same as that which underlies any kind of actuarial work. On the basis of thousands of cases, life insurance companies can determine what are the chances of longevity for persons in various physical conditions and at various ages. On the basis of such tables they are able to determine whether or not a person should be insured who has a particular heart or lung condition, for example.

From the prognostic tables and data presented in this book it is clear that certain prereformatory differences in family and personal background are the same in those offenders who made good in society after their reformatory stay and those who continued to offend against society. But, more significantly, there are some statistical differences in the prereformatory characteristics of reformed and unreformed offenders. Family size, whether the parents are native-born or foreign-born, skilled or unskilled, are, for example, factors not diagnostically different for the reformed and the unreformed.

As a group those who were not reformed have many characteristics that seem to differentiate them from those who are reformed. For example, the unreformed tend to come from homes in which the parents were economically dependent. More of those unreformed than of the reformed were characterized as mentally defective or showing mental pathology.

The book further discusses on the basis of quantitative data the success or failure of various forms of peno-correctional treatment.

Fundamentally the book seems quite well to establish the thesis that neither chance nor various types of punishment but rather the basic makeup of the offenders determines the life pattern of criminals.

As the authors point out (287):

> The *retributive-expiative* theory still too often dictates the sentence. The old argument that punishment is necessary as a "just retribution" or requital of "wickedness" is considerably weakened by the evidence that the causes of criminality are numerous and complex rather than that wrong-doing is "caused" by the calculated exercise of a completely "free will." Official social institutions—the criminal law and its peno-correctional instruments—ought in this day no longer to be founded essentially upon a theory of sublimated social vengeance or that "expiative theory" which is the reverse of the shield of retribution. Vengeance is a destructive and short-sighted emotional basis for coping with the biological and social problem of crime. Not only is it the expression of an infantile way of solving problems, but unjust and destructive of the very purpose of protecting society. The official social institutions of criminal law and penal treatment should not be occupied with the futile quest of making the criminal "expiate" his "sins." That is properly the domain of religion. Society's legal institutions are concerned with the utilitarian possibilities of a correctional régime—possibilities founded upon the social

purpose of the apparatus of justice; namely, the maintenance of the general security, with as little interference with the individual's rights as a human being as may be necessary for the achievement of that social purpose.

In view of this position the authors believe that the sentencing, correcting, and releasing functions in regard to criminals should be in the hands of a qualified body which would include psychiatrists, psychologists, social workers, and other professional men trained to understand human nature and society. The final conclusion of this book seems to the reviewer to be that society would indeed profit if real criminal justice should be administered by wise criminologists who continually strive to replace prejudice, guesswork, and mere concept of legal "guilt" with social and medical facts and legitimate inferences based upon the quantitative study of the facts which have entered into the making of criminal careers in the past.

The study reported in its current stages in this book is unqiue. It is not only full of important implications for the great human problem of the proper treatment of the criminal but it even goes so far as to suggest certain most important leads in the formulation of a really quantitative and deterministic philosophy or science of society.

LEONARD CARMICHAEL

Tufts College.

RECKLESS, W. C. *The etiology of delinquent and criminal behavior: a planning report for research.* Bulletin No. 50, Social Science Research Council. New York, 1943. Pp. xii+169.

In the Foreword, it is stated that this report "may be looked upon as an attempt to promote unified effort by the different disciplines—psychiatry, psychology, and sociology—engaged in the study of the causes of delinquent and criminal behavior" (viii). The purpose of the research planning report is "to review critically the progress of research, to note research trends and promising leads, to locate gaps in our knowledge and deficiencies in our methods and inadequacies in research organization, and to make recommendations for raising research standards and for securing an increase in our scientific knowledge" (ix). The bulletin consists of the report proper by Reckless and four appendices by various contributors.

In Chapter I, Reckless divides past and present contributions to the knowledge of the etiology of criminal behavior into three phases, an earlier phase of particularistic theories, a phase of somewhat disconnected first-hand research, and a phase of reformulation and systematization into which we are now moving.

In Chapters II and III, major emphasis is given to the drive for first-hand data which characterized the phase of disconnected research. The search for causes in the constitution of man and in the situations confronting him is described and some of the principal contributions are outlined. This part of the report is a noteworthy model of clear, concise, sympathetic, but highly critical reporting.

Chapter IV, entitled *Recent efforts to become systematic*, covers three systems: the German school of Criminal Biology with which are grouped the approaches of Healy and Bronner and the Gluecks; Sutherland's approach based upon "differential association"; and Sellin's formulation which shifts emphasis from the legal meaning of crime to its personal meaning to the criminal. Also included in this chapter are four supplementary approaches which contain the elements of systematization: the study of "behavior processing"; analysis of behavior trait differences between offenders and non-offenders; Reckless's own actuarial approach; and the study of response to treatment. Because of its subject matter, Chapter IV cannot maintain the critical level of Chapters II and III, and Reckless does not feel disposed to point out that some of the reformulations are little more than the older particularistic approaches outfitted with empirical trappings which seem in some cases to have been cut to fit.

Suggestions for research occur throughout the report, but Chapter V and two of the appendices are given over specifically to promising research leads and recommendations. The recommendation that all important future research projects be cleared by a conference committee in order to avoid some of the "mistakes in method and neglect of viewpoints of neighboring disciplines, which have seriously limited the value of several previous studies in the field" (158) should evoke warm comment. Reckless points out that previous studies constitute a cogent argument in support of his recommendation.

Other appendices deal with resources and opportunities for research, records and statistics on crime and criminals, and some problems and projects. Although they vary considerably in relevance and coherence with the remainder of the report the appendices should prove helpful particularly to beginners in the field.

The report merits its chief criticism insofar as it fails to achieve the lofty purposes stated in the Foreword. Psychologists will probably feel that their contributions to the understanding of the etiology of criminal and delinquent behavior have been slighted and that the report does not actually represent "unified effort by different disciplines." Furthermore much of the material covered in the report is of an elementary nature—in fact more than half of the report is essentially a digest of four chapters of Reckless's book on criminal behavior.* This should prove disappointing to workers in the field unless they have perchance neglected to read the basic sociological works on the causes of criminal behavior. Psychologists not working in this field will, however, find this report an extremely competent and critical introduction to the etiology of delinquent and criminal behavior, and an excellent general evaluation from the standpoint of the sociologist of the status of research.

DAVID A. GRANT.

University of Wisconsin.

MOORE, HERBERT. *Psychology for business and industry.* (2nd Ed.) New York: McGraw-Hill, 1942. Pp. xiv+526.

Dr. Moore states in his introduction that—

> The value of psychology to the world of business and industry is determined by the contribution that it can make to an understanding of the human forces that operate when people are brought together under the specific demands and controls that the business and industrial worlds make necessary. The extent to which it can help understand and find solutions for situations that are created by people with different abilities, different interests, different hopes, and different attitudes determines the extent to which it will join hands with the engineer and the economists in solving industrial problems.

After this sensible statement the author proceeds briefly but convincingly through some of the significant achievements of industrial psychology, a procedure which should provide the student or layman with a favorable attitudinal orientation toward this field.

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* Reckless. W. C. *Criminal behavior.* New York: McGraw-Hill, 1940, pp. 182–256.

Getting a Job, the second chapter, which achieves the happy double purpose of seeming and being practical to the average college student, is written so as to be of value to the individual in need of vocational guidance.

Subsequent chapters are addressed more to management than to the student or employee; although the interests of the worker are not forgotten. "The least noticeable and yet the greatest cost of improper selection is borne by the worker" and similar remarks emphasize that both management and the worker experience a dual benefit from aptitude testing, sound hiring procedures, employee rating, job training, motivating the employee, promoting the employee, studying and reducing accidents, reducing fatigue, adjusting the employee, and winning the consumer.

A reader will be impressed with the number and appropriateness of the tables and illustrations, which immediately testify to the extensive and critical survey of research that has gone into the compilation of the book. The many references to appropriate scientific literature are properly documented. As all books are biased by the interests, achievements, and philosophies of their authors it is to be expected that this work should be no exception. It places great emphasis upon psychological testing (150 pages), employee training (40 pages), employee accidents (50 pages), fatigue (40 pages), and consumer relations and advertising (60 pages). Relatively brief treatment is given to attitudes and to visual problems and visual testing. The value of the very excellent chapters on testing would be enhanced if complemented by a chapter dealing with the practical problems of setting up a testing program in a company, obtaining the support and cooperation of foremen and management, and establishing acceptable routine procedures which guarantee discreet but complete utilization of data supplied by the psychologist.

Some industrial psychologists will question Dr. Moore's statement that " . . . the services of a reputable organization can serve the occasional needs of business and industry in a more adequate manner than could the constant presence of one psychologist whose field of concentration limits him to a small number of aspects of the industrial situation" on the grounds that the psychological needs of most large companies are continuous rather than "occasional" and that the permanent psychologist has the opportunity to obtain a deeper understanding of the particular problems of his own company and specific industry than has the outside organization; even though the additional service of an outside organization may be very worthwhile on specific major problems. Also, many companies hesitate to release confidential records and data to an outside agency.

Although there are few serious omissions in this valuable book, the section on fatigue and boredom is incomplete in that the important developments related to combatting fatigue and boredom—such as the introduction of rest period lunches and the acceptance of music in repetitive work situations are not presented. These innovations have gained general acceptance only since the book was written.

WILLARD A. KERR.

Industrial Opinion Institute.

BOWLEY, AGATHA H. *Guiding the normal child.* New York: Philosophical Library, 1944. Pp. xv+174.

This simple and concise little book ambitiously attempts to cover the entire period from birth to adolescence, summarizing essential factual data from research studies, and offering concrete advice on the problems of normal children, including breast-feeding, teething, weaning, toilet training, language development, social-emotional development, play, etc., and many problems which are sometimes considered to verge upon the abnormal, such as temper tantrums, nail-biting, head-banging, delinquency, backwardness, and mental deficiency. It even includes sections on remedial teaching methods for children with specific difficulties in arithmetic, reading, and spelling. The general point of view is that "a child's happiness is far more important ultimately than the level of his scholastic achievements" and also that "most of us grown-ups have a good deal to learn about not interfering" with the normal growth process.

Professional psychologists will probably be familiar with most of the facts and theories cited and in agreement with the concrete suggestions for guidance; but the parents, teachers, social workers, and physicians for whom the book was primarily intended should find it helpful, because it brings together into one clear, simple picture the essential practical conclusions to be drawn from a mass of experimental, clinical, and educational data rarely summarized in such a brief, nontechnical form.

The only chapter having much new value for psychologists is that entitled *Children and the War.* The author is a Scottish psychologist with much direct experience in working with children during the present war. In addition to her original data, she summarizes more than a dozen recent studies by other investigators. Her conclusions are optimistic. Children assimilate air raid experiences remarkably well on the whole. Even babies rapidly condition themselves to sirens and noise. She finds that most children are less disturbed by air raids than by evacuation without their parents. Preschool children evacuated without their parents do not usually adjust well. Neither do adolescents. School children may adjust fairly well to evcuation if the school unit remains intact and their own teacher goes with them and the foster homes are carefully chosen. Children seem to require the presence of familiar and trusted adults; but with these to set them a brave example, they can learn to live dangerously and adventurously and like it.

MABEL F. MARTIN

Peru State Teachers College.

NOTES AND NEWS

FRAZER HOOD, professor of psychology, Davidson (N. C.) College, died, June 19, at the age of sixty-nine years. Dr. Hood had served as professor of ethics and English literature (1902-03), Hanover (Ind.) College; acting professor of psychology (1903–04), University of Oklahoma; professor of psychology and head of the department of education (1913–18), Western Tennessee State Normal School; director, psychological laboratory, and professor of psychology (1919–20), Northwestern University; and professor of psychology (since 1920), Davidson College.

KARL M. COWDERY, academic secretary and associate registrar of Stanford University, died on September 12, 1944, at the age of forty-nine years. Dr. Cowdery received his B.A. degree from Oberlin in 1915, his M.A. from Stanford in 1922, and his Ph.D. from the same institution in 1926. He has served on the faculty of Stanford University since 1926 and is well known for his work in guidance, personnel research and the development of tests.

New officers for the *American Psychological Association*, elected by a mail ballot, were announced by the Committee on the Election of Officers at the Fifty-Second Annual Meeting in Cleveland. EDWIN R. GUTHRIE of the University of Washington is the new *President* for the year 1944–45, CARL R. ROGERS of Ohio State University and Dr. Guthrie were elected as the new members of the *Council of Directors* for the term 1944–47. Since Dr. Guthrie had also been elected to the Presidency, DAEL WOLFLE of the Universityof Chicago was elected at the Annual Meeting as a member of the *Council of Directors* in his stead. The continuing officers of the Association are WILLARD C. OLSON, *Secretary* (1943–46), WILLARD L. VALENTINE, *Treasurer* (1942–47), and SIDNEY L. PRESSEY (1942–45), ROBERT H. SEASHORE (1942–45), C. M. LOUTTIT (1943–46), and DONALD G. MARQUIS (1943–46), *Members of the Council of Directors.*

The results of the mail ballot on the proposed new By-Laws of the *American Psychological Association* were announced and discussed at the Annual Meeting in Cleveland on September 11 and 12, 1944. On Tuesday afternoon, September 12, the business meeting of the *American Association for Applied Psychology* and of the *American Psychological Association* gave unanimous approval to the new By-Laws and to plans for a transitional year to make the merger of the APA and AAAP effective at the Annual Meeting of 1945. The plan continues the *American Psychological Association* with By-Laws which make it inclusive of all interests in psychology. A complete report of the Joint Constitutional Committee, which developed the plan, and of the results of the mail ballot and other actions will be found in the Proceedings in the *Psychological Bulletin* for December, 1944.

The following officers for the year 1944–45 have been elected by the Metropolitan New York Association for Applied Psychology: *President*, W. H. WULFECK; *Vice president*, EDNA E. LAMSON; *Executive Council*, ANNA S. STARR and JEANNE G. GILBERT. GLADYS C. SCHWESINGER continues as *Secretary-Treasurer*, and EDITH M. ACHILLES and JOHN G. PEATMAN continue as members of the *Executive Council.*

A Unit of the Medical Research Council for Research in applied psychology has been set up in the psychological laboratory of the University of Cambridge, of which F. C. BARTLETT is the head. K. J. W. CRAIK has been appointed to the staff of the council as director of the unit. Members of the unit will undertake work elsewhere than at Cambridge, including investigations for the Industrial Health Research Board of the council.

Princeton University announces the promotion of JOHN M. STALNAKER from an associate professorship to a professorship of psychology.

R. N. SANFORD and E. E. GHISELLI of the University of California have been promoted to associate professorships in psychology.

Indiana University announces the appointment of VINCENT NOWLIS, formerly assistant professor of psychology at the University of Connecticut, as assistant professor of psychology. Dr. Nowlis will act as research associate in the studies on human sex behavior being carried out by Dr. A. C. Kinsey.

HERBERT C. MCMURTRY, formerly head of the department of psychology at Yankton College, South Dakota, has been appointed associate professor of psychology at Willamette University, Salem, Oregon.

Lieutenant-Colonel IRVING C. WHITTEMORE, professor of psychology, Boston University, has been appointed morale-services officer on General Mark Clark's specialist staff with the Fifth Army in Italy. Among other duties, he will direct the educational activities of the Fifth Army.

HAROLD B. PEPINSKY, of the University of Minnesota, has been appointed counselor for the Vocational Counseling and Guidance Center, University of Kansas.

A. Q. SARTAIN, associate professor of psychology in Southern Methodist University, Dallas, Texas, is now on leave from the University. He is serving as director of psychological testing and research for North American Aviation, Inc., Dallas Division.

T. GAYLORD ANDREWS, instructor in psychology at Barnard College of Columbia University, has been appointed assistant professor in the department of psychology at the University of Chicago.

THELMA HUNT has been promoted from associate professor to professor of psychology at George Washington University.

Knox College (Galesburg, Ill.) has announced the appointment of CHARLES BUMSTEAD, formerly assistant professor of psychology at the University of Oklahoma, as associate professor of psychology.

RALPH E. DUNFORD, professor of psychology, University of Tennessee, has succeeded John O. Mosely as dean of students.

J. FRANKLIN WALKER, professor of educational psychology, University of Arizona, has been appointed dean of the Graduate School.

F. ALVAH FREDENBURGH, personnel director, Gimbel Brothers (Philadelphia), has become director of industrial relations for Loft Candy Corporation, Long Island City, N. Y.

HENRY P. SMITH, associate professor of education and psychology, Arizona State Teachers College (Flagstaff), has been appointed assistant professor of education, School of Education, Syracuse University, to serve during the absence of Raymond G. Kuhlen, on duty as a lieutenant (j.g.) in the Naval Reserve.

CAPTAIN MILTON E. HAHN, assistant to the officer in charge of the personnel-classification section, U. S. Marine Corps, has been appointed associate professor of education, Syracuse (N. Y.) University, where he will have charge of a graduate program to train guidance officers for schools and business and will organize a guidance center for returning veterans and all other students.

Beginning with January, 1945, it is planned to bring out a *Journal of Clinical Psychology*. It will be a professional journal limited to the publication of original research and authoritative theoretical articles in the field of clinical psychology. The journal will appear quarterly and will contain about three hundred and twenty pages annually. Editorial and business offices will be at the Medical

College Building of the University of Vermont, Burlington. One of the purposes of the *Journal* will be to work toward a more formal organization of professional resources in clinical psychology and to improve interprofessional relations with other sciences, including psychiatry.

In the seventh edition of the Biographical Directory of *American Men of Science*, the following psychologists have been starred: CHARLES W. BRAY, Princeton University, ELMER CULLER, University of Rochester, CLARENCE H. GRAHAM, Brown University, JOY P. GUILFORD, University of Southern California, EDWIN R. GUTHRIE, University of Washington, ERNEST R. HILGARD, Stanford University, CARLYLE F. JACOBSEN, Washington University, DONALD G. MARQUIS, Yale University, GARDNER MURPHY, College of the City of New York, BURPHUS F. SKINNER, University of Minnesota, STANLEY S. STEVENS, Harvard University, ROBERT C. TRYON, University of California, Berkeley, MORRIS S. VITELES, University of Pennsylvania. The number of now living psychologists who have been starred in the successive editions is as follows: 1*st edition*, 19; 2*nd*, 7; 3*rd*, 15; 4*th*, 9; 5*th*, 11; 6*th*, 12; 7*th*, 13; for a total of 86.

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Psychological Bulletin

GERMAN INDUSTRIAL PSYCHOLOGY IN THE FIFTH YEAR OF WAR

H. L. ANSBACHER
Office of War Information, London

This survey of industrial psychology in Germany in the fifth year of war may leave the reader with an unexpectedly favorable impression of the German scene. He may first be surprised to learn that such basic work is still being carried on. To this one must answer that if the chaotic state of Germany were such that quiet basic work were no longer possible, German resistance would be much weaker than it is. Secondly, the reader may be surprised to learn that compulsion is not the only force behind the German war effort. But at this point it may be said that there has always been an inclination on our part to see only the terror aspect of Nazism. A strong morale could never have been built with avoidance of punishment the only motive. Actually, in addition to terror, reward has always been used by the Nazis in the form of social legislation and welfare institutions and in efforts to give the common man opportunities for advancement. The material along these lines, presented below, also affords a glimpse into the difficulties arising from the general atmosphere of compulsion. For example, the importance of tactfulness in dealing with the worker is repeatedly stressed, indicating, as one might expect, that tactfulness is often wanting.

Mention of the material for this survey and its limitations should be made here. Although all sources but one (4) are newspaper accounts, they contain sufficient substantial material to warrant presentation in this journal. Since no other sources are available, the only alternative would have been to communicate no information at all to the American psychologist regarding this recent aspect of applied psychology. As to the extent of application of the various measures, there is no reason to doubt that they are applied at least in the specific instances described below, and that there is an official desire to see them applied even more widely. This was indicated by an apparent propaganda campaign on the subject during February and March, 1944. Fifteen of our 20 original references are from this period, and additional newspaper accounts were found, including one illustrated motion and time study. Probably the entire German press carried similar articles at that time.

I. Manpower engineers (MPEs).

Germany in the 5th year of war is confronted with a tremendous and progressive manpower shortage, in the face of which it becomes ever more urgent to mobilize the last reserves of production capacity. This mobilization was officially organized in October, 1943, by the Reich Minister for Armaments and War Production, Speer, through the appointment of engineer Gotthard Friedrich to the newly created office of Reich Manpower Engineer (Reichs-Arbeitseinsatzingenieur). He is assisted by 34 regional manpower engineers (MPEs) directing the efforts of 5000 plant MPEs who are nominated by the individual managements from among their personnel and are confirmed by the government. Initially only plants with over 300 workers were to have MPEs, appointments to be made for smaller plants as well, should the plan prove successful.

The task of the MPE is to examine where manpower can be spared without impairing production, and to increase the output of the remaining workers so that 9 men will do the work of 10 (**22**). To accomplish this end great powers have been delegated to the MPE. He can give orders on all questions pertaining to his task. For his decisions he uses the recommendations of the plant physician, psychologist and motion-and-time study man. According to Speer's proclamation the MPE has to carry out his task "free and independent of plant interests, solely with regard to the most economical means of manpower utilization." He thus is called "the conscience of the plant." Apparently this interference with the regular management did meet with certain resistance judging by a mention of a recent meeting of MPEs of the chemical industry (**22**). There we find that many difficulties were encountered from the inception of the program, and that although it met with criticism in the beginning, it has since become an integral part of German industry.

The institution of MPEs is the outward expression and final coordination of great efforts to increase industrial efficiency through all known methods of industrial psychology and motion and time study, in many of which Germany is only now catching up with America.

II. Employee testing.

"The manpower shortage has brought the problem of industrial psychology again to the fore. Especially the larger industries are using aptitude testing in an attempt to place all their present workers where they can function with the greatest efficiency" (**18**).

The problems and methods of employee testing are presented in an article by Bornemann (**4**) in a journal of the German steel industry on which the remainder of this section will be based. Employee testing is seen to fall into 3 developmental steps: (1) psychotechnical tests, (2) appraisal of personality and (3) aptitude in relation to vocational demands.

1. *Psychotechnical tests.* These are concerned with: intelligence and mechanical comprehension; manual ability; and willpower, attention and memory, the latter as an important auxiliary function. After about 25 years of research and practical experience, the development of these tests is considered completed. The following are the problems of the present:

a. Existing methods must be systematized and synthesized. To this end the Reich Labor Ministry has devised a standard series of tests to be adopted after the war by all German vocational guidance bureaus.

b. It must be realized that tactfulness is required to enlist the cooperation of the testee.

c. Tests for the many foreign workers must be devised with the view to finding those who can be trained to do skilled work. The Institute of Industrial Psychology and Education (Institut für Arbeitspsychologie und -pädagogik) of the German Labor Front has worked out a method suitable for group procedure (12).

d. Written trade knowledge tests had to be developed to facilitate the work of the MPE, and for these the fill-in type of question was used (5). The written tests are supplemented by job performance tests.

2. *Characterological examination.* This is of great importance because by far the larger number of complaints of supervisors relate to personality factors. Characterological appraisal takes the lines of German military psychology (2), and consists of: expression analysis, life history, thought analysis (Geistesforschung), and action analysis. A new book by Simoneit (14) is referred to in this connection, from which it would appear that since the curtailment of military psychology (1), Simoneit has been devoting himself to industrial psychology.

In *thought analysis*, the examinee may be asked to write within a stated time a brief essay on "What would happen if the sea level would drop 300 meters?" or on ". . . if there were no clocks and watches?" The results are rated for ability to think, richness of thought and training of thought. Values and attitudes are tested by the picture preference and description test (13), where the testee is asked to give the reasons for his preference in writing. *Will and action analysis* includes the command series and the leadership test. In the first the testee, as one of a group of four, is ordered to execute certain physical actions under stress, from which ability to concentrate, perseverance, will-power, bodily agility, cooperation and other traits can be observed. In the second, the testee is asked to lecture to a group of 6 to 8 on a theme chosen by himself, or to lead their discussion, as a measure of his ability to assert himself mentally and through his personality. *Expression analysis* is incidental to these situations.

The important difference from military psychology is that whereas in military psychology the group judgment of several psychologists was required, here apparently one psychologist's judgment is accepted, thereby greatly reducing the validity of such qualitative procedure. Bornemann mentions that the method makes great demands on the skill of the psychologist, but that a sufficient supply of adequately trained people is assured for the future through the newly-created and broadened training facilities leading to the degree of Diplome Psychologist (see 1).

3. *Psychological job analysis.* Today's main task is to determine which particular aptitudes can better be dispensed with in one job than in another. An important basis for meeting this task is provided in the job analyses of the Reich Institute for Vocational Training in Commerce and Industry (Reichsinstitut für Berufsausbildung in Handel und Gewerbe) the publication of which began in 1938 and will eventually include all vocations. From these comparative job analysis tables can be developed, listing in the left-hand column the various jobs of an industry, and across the top 28 psychological traits grouped under the headings of motivation, intelligence, willpower and character, special intelligence patterns, motor ability and sundries. For each job the requirement of each trait is entered in ratings of a seven-point scale. If a certain job is to be filled, one needs to test only those traits for which the requirements are high.

At this point Bornemann raises the question: "To what extent does the aptitude of the German people as a whole meet the job requirements?" In reply, he refers to studies not yet published which seem to indicate an oversupply of practical-manual aptitude and a not inconsiderable shortage of theoretical-intellectual ability. This is seen as a limitation to further technological development, quite apart from technological difficulties. It is a surprising finding to us, since formerly the Germans were known as good theoreticians, and no such shortage has been reported from other nations. Could it be the result of ten years of the Nazi educational system, openly anti-intellectual as it is?

The selection program is validated by follow-up reports. For this purpose a questionnaire, which corresponds to the job analysis chart, is filled in by the supervisor at regular intervals.

Industrial merit rating is also advocated by Steinwarz (15), director of the Bureau for Increasing Efficiency, Vocational Education and Management (Amt für Leistungsertüchtigung, Berufserziehung und Betriebsführung) of the German Labor Front, as a method in its own right for proper industrial placement. This bureau has been instrumental in developing standardized rating sheets for use by supervisors, which have already been introduced in several industries.

III. Rationalization of industry.

1. *Motion and time study.* Motion and time study in Germany goes back to the inflation years when the metal industry was seeking a yard stick for job performance independent of fluctuating monetary values (**3**). It is known as the Refa method, Refa being an abbreviation for Reichsausschuss für Arbeitsstudien (Reich Committee for Work Studies).

Since 1935, the Refa, working in close cooperation with the German Labor Front, has trained 50,000 "time takers" (Refa-men). Refa training courses are taken by employees from the various industries, the qualifications for admission being (1) good character, (2) sound ideology, (3) understanding of managerial and leadership problems, and (4) vocational knowledge and ability. The curriculum includes (1) flow of work, (2) determination and utilization of skills, (3) Refa-timing, (4) work study, (5) time study and its uses, (6) just wages, (7) time study methods (**11**). The Refa-man also receives general psychological training.

With the present program of rationalization, the Refa receives particular stress. Its results in office work (**21**, **11**), in furniture and affiliated industries (**24**), and in the textile industry (**23**) are described. Also its advantages in determining just wages are pointed out (**3**). One of its main functions appears to be to breakdown the jobs formerly done by skilled workers into a number of simple manipulations which can be taught quickly to unskilled and foreign labor (**20**, **24**). Skilled labor is assured that this will not jeopardize their position after the war (**20**).

In view of the unpopularity of Taylorism, especially in Europe, it is emphasized that the Refa method is better and more humane than American or Russian methods to gear labor to mass-production (**3**). German rationalization of industry is a close approximation to organic life and creates "the living and healthy German plant which is capable of freeing the vital forces of the German through ever higher deeds of production," thus greatly increasing job satisfaction (**6**).

2. *Industrial suggestion system.* This system (Vorschlagswesen) was inaugurated in 1941 to increase efficiency by utilizing the inventiveness of every worker. In 1941, 3,000 plants participated and furnished 50,000 suggestions of which 25% were found useful. By 1943, 35,000 plants participated with 300,000 suggestions of which 60–70% were useful. The originators of useful suggestions receive honors and small rewards. Whereas in large plants only 5% of the workers participated, in small plants sometimes over 50% took part when the system was encouraged out of realization of its usefulness to labor management. Thus, it was concluded that the suggestion system should be accompanied by some general guidance (**10**), and accordingly, a comprehensive guided sugges-

tion system is now being launched by the German Labor Front through the Bureau mentioned above. For such a system the following considerations have been made.

Guidance should be entrusted to an invention councilor (Erfinderberater), with one councilor for each 600 workers. He should present to the workers specific problems raised by the central organization, as well as encourage participation. Only those men should be approached, however, who show promise of being able to deal with the problems, else lack of success might result in psychological casualties possibly followed by a real neurosis.

Guidance must differentiate between

1. the dynamic type of worker, who finds tasks on his own initiative, although his ultimate suggestions may not be perfect in form and his attitude may leave things to be desired;
2. the mechanistic research type who, when a task has been tactfully suggested to him and explained, will devote himself to its solution with a high degree of perseverance;
3. the static conservative type, who needs the task clearly stated because he reacts only to pressure, being on principle against any changes and thus often a hindrance.

The general principles of such guidance are summarized as follows:

1. As many employees as possible should be included.
2. The councilor should be assisted by a Party representative and a Labor Front man to remove all human-nature obstacles.
3. Frictions should be avoided as far as possible.
4. Guidance must be done tactfully.
5. There must be accord in the management about the matter.
6. Increase in plant production is secondary to national benefit.
7. The goal must be optimum plant and individual performance, that is: joy in work!

The plan is described as a typical example of German industrial rationalization: the worker becomes a full participant. To this end a "psychological climate" is required of mutual respect and confidence, in which, however, individual psychological inhibitions are removed in an understanding yet firm manner. That is why so much importance is attributed to industrial leadership and industrial psychology (27). Apparently it is the Party representative's function to insure the desired "firm manner."

IV. Vocational selection and training camps.

(1) *Selection camps for the gifted.* Early under the Nazi regime contests were instituted for all vocations as an incentive to apprentices, and other young people. These contests have recently been implemented by vocational selection camps to single out the most promising youths for special advanced training and study, with the view of supply-

ing commerce and industry with people who some day can fill responsible positions. The demand for such people is considered particularly urgent at present (7). Thus these selection camps must be seen as another measure to combat the increasing manpower shortage. They deal with young gifted specialists who have already distinguished themselves and have shown industry, reliability and character. Of these the best ones again are selected for further advancement, to avoid waste. Admitted to the camps are youths recommended by their employers, or proposed by chamber of commerce or the army, also former victors of vocational contests.

Selection camps have been functioning for many years in military selection (2), and the new vocational camps are modeled after the earlier military ones. Like the vocational contests, they are under the auspices of the German Labor Front, and in some instances also the Hitler Youth. They are located in pleasant country houses, and everything is done to avoid the atmosphere of a formal examination (16).

Procedure: The duration of a camp is usually one week. The participants live like soldiers, 8–10 in a group under a leader for the duration of the selection. The group leaders are experienced youth leaders, mostly from industrial training departments. The selection board consists of the camp leader, the group leaders, specialists, a psychologist and a physician. Appraised are (1) knowledge and ability, (2) leadership quality, (3) character and personality, and (4) health.

The *group leaders* evaluate the members of their groups from the human and character point of view on the basis of their daily contact with them. Two ideological talks are also worked out by the groups. The *psychologist* evaluates special talents and abilities, and general intelligence; determines technical comprehension and general education by written tests; asks the candidate for a written statement of his interests; and in conclusion, interviews each participant. The *camp leader* appraises each participant on the basis of personal contacts and conversations. He also sets the themes for the essays, on the basis of which intellectual flexibility is determined. First-class *specialists* are called in from the various industries to assess specialized technical proficiency, by written and oral tests. Evaluation is essentially influenced by the promise a youth holds to fill a leadership position in this field some day. The *medical examination* is concerned with general health, heredity and race.

In a *final conference* the selection board brings the various findings together to arrive at a decision. The decision is explained to the participant in detail. He is told where his strength lies and where he must still improve; and effort is also made to convince him of the validity of the decision. The results are communicated to his district and industry, so that these can take special care in case he deserves encouragement and support, and to use the results in placement (7).

So far, selection camps have been conducted for the metal industry, the chemical industry, and other war industries where they are said to have shown remarkable results. A few details are given regarding the camp of the metal industry where future inventors, airplane engineers, electrical engineers and low-voltage technicians are selected. Among their trade tests are: construction of bridges, calculation of gearing ratios, problems of metal production. The requirements for passing are ability of constructive technical thinking, knowledge of mathematics, imagination, will power, leadership ability, health. Genius is rare, even in these camps, but has occasionally been found. All participants in this particular camp were considered worthy of advancement and 70% capable of advancement (16).

The selection-camp method has been introduced also for candidates for elementary school teaching (26), and for musicians and actors (19, 8). The reason for the latter is that the continuation of art is considered to be of vital importance. But to avoid waste of manpower, only the most gifted must receive training. Of 64 participants in an art camp, only 29 were selected, while the rest were asked to return to their jobs.

(2) *Training camps*. Training camps may also be mentioned as an aspect of present-day German industrial psychology. The course for Refa-men described earlier is in the form of a camp session. Other such training courses have recently been introduced for personnel managers. These are conducted by Steinwarz's bureau at its schools in Vienna an Diedenshofen (9). Up to the present the German personnel managers apparently have been oriented primarily toward the administrative and legal aspects of their office. The new courses are aimed to make them realize that their main function is, after all, dealing with human beings. If workers and employees are not treated with tact and consideration, poor morale will be the consequence. The personnel manager must be trained to be cordial and just, the worker having a fine sense as to whether he is met with a genuine attitude of friendliness or only a pose. Qualifications for the personnel manager are a sincere interest in people, tactfulness, and intelligence. One of his new tasks is the organization of personality information on each employee, including a personality profile.

The most complete description of a training camp is found in an article on the training of foremen (25). One large chemical industry in southwestern Germany has been conducting a leadership course for foremen for the last year. Thirty to forty foremen at a time take this course where the atmosphere again is one of good fellowship with outings and a farewell party. There the *industrial psychologist* gains the confidence of the foremen and discusses with them problems of leadership on the basis of practical experiences contributed by the students. Proper treatment of workers is considered as practically the only field where reserves in manpower can still be mobilized. While formerly foremen were selected purely from the technical point of view, old foremen now receive this training in leadership, and new promotions should be made only after psychological examination of leadership ability. Every evening of the camp session a talk is given by one of the plant executives: the president, the personnel manager, the manpower engineer, the plant physician, each discussing problems of his field which concern the foremen.

After the camp session, the group continues to meet with the psychologist at 4–6 week intervals for discussion of any leadership problem which may have arisen. The outcome is an insight into industrial relations and the significance of the function of the foreman, and a "more or less noticeable loosening up" of the participants. A camp of this nature is only one aspect in a large foreman training program which has been under way for some time under the auspices of the German Labor Front. Modern depth-psychology is given credit for the attempt to train leadership at all.

V. Summary.

Early in the 5th year of war manpower engineers have been appointed in the larger industrial plants in Germany with the authority to enforce any measure needed to mobilize the last manpower reserves. In connection with this drive, the work of industrial psychologists and motion and time study men has received wide attention. The following was found in the present brief survey:

1. Industrial employee testing is carried on along lines developed by German military psychology, and with similar aims.
2. Comparative psychological job analysis is undertaken, and a survey showed undersupply of abstract intelligence among the population as a whole.
3. Industrial merit rating is promoted as a method of proper individual placement.
4. Motion and time study (Refa method) finds increased application, and 50,000 Refa men have already been trained. The curriculum includes psychology.
5. A guided industrial suggestion system is being inaugurated to enlist every worker's inventive ability. The application of this system apparently also involves psychological training.
6. Selection camps for gifted young industrial workers are conducted, as well as selection camps for teachers, actors and musicians.
7. Training camps are conducted for Refa men, personnel managers and especially foremen. In the latter the psychologist seems to play the main part.

Throughout these various efforts the trend becomes apparent to raise industrial morale by friendly treatment of the workers and by offering opportunities for advancement. In this respect the present effort is reminiscent of a German drive conducted in 1917 under the slogan of "Gangway for the able!"

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BIBLIOGRAPHIES IN CHILD DEVELOPMENT: 1931-1943

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In 1931 Allen† published a list of the most important reference bibliographies in child behavior and development which had appeared up to the year 1930. Because the amount of research work in this field which has been published since that date is so great, it has seemed worth while to bring the bibliography up to date (July, 1943) not only for the convenience of research workers and teachers of child psychology but also as a rough indication of the developing trends of interest within the field. While it is recognized that neither the number nor the length of the bibliographies on a given topic affords more than a rough approximation to the amount of psychological activity devoted to it, it is nevertheless true that some correlation exists. The serious student of any problem commonly begins his research by examining the literature, and most writers of experimental articles append at least a brief list of references to their published reports. Many of these lists, however, are short and highly specialized. Upon the assumption that the titles in these short lists will, for the most part, be included in the more comprehensive bibliographies in the same field and because of the need of confining our own list within reasonable limits, we have not, as a rule, included bibliographies having fewer than 50 titles. Some exceptions have been made when a shorter list is made up largely from unusual sources or deals with a topic on which the amount of published research is small.

In making the selection, the following considerations were held to be of main importance: (1) recency, upon the assumption that later lists will, as a rule, include at least the more important titles found in the earlier ones, (2) length, (3) selectivity with reference to the topic under consideration (some very long bibliographies are merely omnibuses that apparently include practically everything the author has ever read!), (4) emphasis upon articles dealing with children, and (5) completeness. In order to avoid overlap with Allen's list, no bibliographies appearing earlier than 1931 have been included. For the most part, only American and a few British sources have been consulted, although a fairly large proportion of foreign-language titles appear in many of the lists.

A number of areas closely connected with the field of child development but not truly falling within its range have not been covered. Among the more important of these are the following: behavior problems and juvenile delinquency, mental hygiene, educational psychology nursery school education, methodological studies, including mental testing (except for a few of the very comprehensive bibliographies of mental tests that include a goodly number of titles dealing with the growth of intelligence), children's diseases and child nutrition, child training, parental education, educational and vocational guidance, child labor and social welfare. Allen's list includes some compilations within most of these fields; a fact that makes the two sets of reference material not entirely comparable with each other, but the volume of literature which has appeared during the past twelve years is so great that the inclusion of these topics would have brought our list to prohibitive length.

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* Prepared with the assistance of Genevieve Arnold, Barbara Birbeck, Mary L. Hronek, Mo-chuen Hsi, Josephine Lehmann and Edna Olson.

† Allen, C. N. Bibliographies in child study and developmental psychology. *Psychol. Bull.*, 1931, 28, 277-296.

For convenience in reference we have divided the material into a number of broad groups. This plan was also followed by Allen but changing trends of interest have made it appear wise to revise his classification to some extent. As far as possible, the original publications have been examined in all cases; we have not followed Allen's practice of accepting the data given in the *Psychological Abstracts* at its face value except in a very small number of instances where the original sources were unavailable. As a result of this inspection, many lists, some of rather imposing length, were rejected because they failed to meet one or another of the criteria that had been decided upon. While it is practically certain that some important bibliographies have inadvertently been overlooked, an attempt has been made to list the most significant and complete compilations of each of the indicated topics that have appeared during the past twelve years.

General sources: The three major abstract journals, *Biological Abstracts*, *Child Development Abstracts*, and *Psychological Abstracts* unquestionably provide the most convenient means of keeping in touch with the current literature. Moreover, through their annual *Subject Indexes* they render it possible to locate the studies that have appeared on a given topic during any year. In addition to these, certain journals and monograph series appearing at more or less regular intervals devote special sections to summaries of the literature on child development. The *Elementary School Journal* publishes an annotated bibliography of investigations on the development of infants and preschool children each year in its March issue; a similar bibliography on exceptional children appears in each May number. The *Review of Educational Research* presents annotated bibliographies on various special aspects of child development at frequent intervals. Very complete reviews of special topics in this field also appear from time to time in the *Psychological Bulletin*.

Certain monograph series appearing at irregular intervals make a practice of appending excellent bibliographies to the experimental studies reported. Among these may be mentioned particularly the *Genetic Psychology Monographs*, the *Monographs of the Society for Research in Child Development*, and the *Monographs of the Child Welfare Station of the State University of Iowa*, the *Institute of Child Welfare of the University of Minnesota*, and the *Institute of Child Development of Teachers' College, Columbia University*.

Handbooks. At the time of Allen's study, nothing that could properly be regarded as a general reference book on child development had appeared. Since 1930, two editions of the *Handbook of Child Psychology* edited by Carl Murchison have been published, and a third edition, under the editorship of Leonard Carmichael, is now in press. Each of these notable volumes (**2**, **3**) contains from 20 to 30 chapters on various aspects of child development and behavior, with very complete bibliographies appended to each. The *Encyclopedia of Educational Research* (**1**) edited by Walter Monroe has a special section on child development. Each of the 17 short articles in this section is followed by a brief but well selected list of references. The *Thirty-eighth Yearbook of the National Society for the Study of Education*, (**4**) "Child Development and the Curriculum" is likewise made up of special papers on different topics and the appended bibliographies, although selected with particular reference to their significance for child education, are more nearly comprehensive than those in the *Encyclopedia of Educational Research*.

General Texts. Under this heading Allen lists 48 titles with dates ranging from 1895 to 1930. This number is, however, very deceptive since there are numerous repetitions (the *Twenty-eighth Yearbook of the National Society for the Study of Education* receives 7 listings in this group alone, as well as a number of additional citations under special topics). Other titles deal with such special topics as psychoanalysis, nursery school procedures, behavior problems and the like. Only 18 of the 48 titles could properly be classed as general texts in child psychology. In contrast, the last twelve years have yielded at least an equal number of texts with very complete bibliographies as well as many more that have not been included in our list because their reference bibliographies were not sufficiently complete. The rapid growth of interest in the field is clearly mirrored in the marked increase in the output of textbooks. Some of the more popular of these have already gone through several editions.

Physical growth and development. Instruments of precision for the measurement of physical development antedate by many years those for the measurement of other types of growth. The early period of experimentation and the collation of the more obvious types of data in this field is past. Publication of the very complete bibliography of studies on the physical growth of children which was prepared by the Children's Bureau in 1927 (No. 188 in Allen's list) and the elaborate catalogue compiled at the University of Minnesota under the direction of Scammon* made further reviews in this field unnecessary for the time being. In Allen's study, references on physical growth are included in a miscellaneous grouping along with those dealing with motor control and sleep. Only 3 of his citations have to do primarily with physical growth.

Modern studies of physical growth show a number of rather notable trends that differentiate them from those of an earlier period. There is greater emphasis upon longitudinal studies of large groups of children measured at regular intervals over a period of years. The advantage of this type of approach has been pointed out especially by Shuttleworth (169) who has shown the great decrease in the experimental error of prediction resulting from the elimination of sampling errors that arise when age standards are based upon cross-sections of the population, which has been the general practice up to comparatively recent years. With the shift to a longitudinal approach, individual differences in growth trends as well as in momentary status have been more carefully observed and studied. The importance of noting variances as well as central tendencies of group measurements and of including these figures as essential features of standard tables is recognized. Bibliographies on some of the less usual measurements, such as Boyd's very careful compilation of the widely scattered literature on growth of the surface area of the body (25) also indicate the relatively advanced state of scientific activity in this field. Mention should also be made of the extensive work that has been done on the physical changes appearing at puberty (165, 169). For the most part, these have been included in the section on adolescence.

Motor development, including sleep. As in the case of physical growth, modern studies of motor development show a definite trend toward a longitudinal approach. Greatest interest has centered about the periods of infancy (47, 51, 142, 143, 146) and adolescence (43).

The earlier bibliographies cited by Allen on the subject of sleep tended to be very inclusive, with only a relatively small number of titles dealing with the sleep of children. Of the more recent compilations, that by Kleitman (48) is also unclassified, although it includes among its 1400 titles a goodly number on children. Thompson's list (53) is confined to the sleep of infants. The most generally useful is that by Renshaw, Miller and Marquis (50) which is well classified and indicates the various types of modern approach to the study of sleep.

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* Available in the form of a card file for use at the University by any interested person. Never published because it was felt that its great length would have made the cost disproportionately high.

A large number of brief reference lists on different aspects of the development of functional laterality have appeared during the past decade, and there have also been a good many reviews of its hypothetical relation to speech and its disorders, but we have been unable to locate any really inclusive and recent compilation of the literature on this much discussed topic. Selzer (**52**) stresses the problems of diagnosis and discusses remedial measures for problems assumed to arise from a change in dominance, while Downey's 1933 review (**41**) brings together a good many of the the more popular as well as the scientific reports.

Sensation and perception. Allen includes no bibliographies in this field, which, until recently, was but little explored by child psychologists. Scattered studies have appeared, it is true, for more than half a century but there have been few systematic attempts to bring the material into organized form. Even now, the amount of experimental work on the *development* of these functions is not great, though the sensory abilities of the neonate have been catalogued in some detail and there have been a few investigations on nursery school children. The development of color preference, which may be related to color vision, (**58**) and the ability to react selectively to differences in form have received some attention. Cruikshank (**56**) has assembled data on the interesting phenomenon of size-constancy from which little evidence of a "learning" process can be noted. This, of course, may mean only that learning is completed before the earliest age at which it has proved feasible to measure it.

Language development. In his review of this field, Allen predicted that the improved methods of control utilized by McCarthy* would set a standard for many subsequent investigations. That this prophecy has been fulfilled is evidenced in the shift of emphasis from the casual records of the vocabularies of single children or of groups with undescribed linguistic and social background that were characteristic of an earlier period to the modern insistence upon the use of scientific criteria for defining both the sampling of subjects and the conditions under which the data were obtained. Better attention to experimental design is also shown in comparative studies of the language of special groups, such as the studies of twins, singly-born children and only children by Davis (**63**) and of bilingual children by Arsenian (**62**) and Smith (**69**). General surveys of recent developments in the entire area of linguistic development have been made by Anderson (**61**) and Sanford (**68**).

Intellectual development. A number of outstanding trends in the study of intellectual growth have been apparent during the past decade. First, there have been persistent attempts to develop measures by which the intellectual development of infants and young children may be appraised and their future mental progress predicted. The result has been the production of a rather large number of infant and preschool scales that show reasonably high self-correlation when the testings are separated by short time-intervals, but thus far no tests have been devised that show a significant correlation with the measured intellectual status of the same children in later childhood and adolescence. When the first tests are given before the age of 15–18 months, the correlations with later standing are zero or slightly negative (**72**, **76**). Tests given during the nursery school period yield only a low or moderate correlation with those given during the school period or at maturity, with the reported *r's* ranging from about +.30 to +.70, according to the age of the children and the conditions of testing. By the age of six or seven years, however, the developmental process has become fairly stabilized. Intelligence quotients obtained at these ages show almost as high a correlation with final status as they ever will. If the generally accepted hypothesis that the mental growth curve is parabolic in form is the correct one, this, of course, is quite to be expected.

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* McCarthy, Dorothea A. *Language development of the preschool child.* Minneapolis, Minn., University of Minnesota Institute of Child Welfare Monogr. No. 4, 1930. Pp. xii+174.

The question of the possible effects of environmental stimulation and special training procedures upon mental growth has provoked much experimental work and aroused almost an equal amount of controversial discussion. Both volumes of the *Thirty-ninth Yearbook of the National Society for the Study of Education* (**80**) are devoted to this topic. The interested reader is referred to this source both for original material and for many very complete and well selected bibliographies on the various phases of the question. Woodworth's (**89**) admirable critique of this Yearbook and of the literature upon which it is based should also be consulted.

A third important trend in the recent literature on intellectual growth is seen in the increasing use of longitudinal studies of the same children who are tested repeatedly over a period of time. This trend was also noted in the previous discussion of the work in physical growth. The advantages of this method in controlling the sampling are obvious. Furthermore, when, as is frequently the case, not only mental tests but physical measurements, educational tests and school progress, and personality measurements and observations are also included in the schedule, it becomes possible to investigate the changing trends of relationship among these variables as well as the growth of the separate functions.

We have made no attempt to include all of the many bibliographies on mental tests and testing that have appeared since 1931. Allen has listed the earlier compilations, but since his time the number has become so great that the amount of space required would be prohibitive. The very comprehensive lists by Hildreth (**78**) and South (**86**) and the two editions of Buros' Mental Measurements Yearbook (**74**, **75**) cite the most important of the books and articles in this field.

Learning (including conditioning) and attention. Although learning is far from being a new field of psychological investigation and children have been used as subjects in studies of learning for half a century or more, there are nevertheless significant differences between the older studies and those of more recent date. For the most part the older work with children was oriented toward the practical problems of formal education. Only recently has the study of learning in children become sufficiently divorced from pedagogy, sufficiently isolated from the studies of mental and motor development to warrant a special classification in the field of child development. Gradually we are coming to realize that learning, like other mental functions, has its developmental aspect.

Before the outbreak of the present war, a very important series of investigations in the field of conditioning was being conducted in Russia with children as subjects (**96**). In this country, the conditioning of infants and particularly of neonates has received considerable attention during the past decade or more.

The old concept of "attention" has been broken down into its behavioral aspects and considered in relation to different situations (**98**, **100**). The relation of ease of learning to such factors as age, intelligence, race, physical condition, and of varying modes of presentation of the material to be learned continue to be popular subjects of investigation.

Emotional, social and personality development. Under this heading, Allen cites 26 bibliographies, many of which, however, are made up chiefly of references to the popular literature on child training. This is understandable enough when we recall that until comparatively recent years, attempts at scientific study of the growth of non-intellectual characteristics were few. However, the last ten or fifteen years have been notable for the many attempts at a scientific approach to those areas of child personality and conduct hitherto regarded as inaccessible to controlled experiment. The studies of Lewin and his co-workers have been rich in suggestions for research in field theory, personality structure, and on the effect of various types of frustration. At the time of Allen's report, the methods of time-sampling and of the situational analysis were still comparatively new; since that time they have been subjected to more careful scientific scrutiny and some of the early sources of error in their use have been corrected. Projective methods, including the Rorschach technique had not then been sufficiently popularized in this country to produce a single bibliography. Formalized personality inventories were limited almost wholly to revisions of the

Woodworth Personal Data Sheet devised for use with soldiers during World War I, and about the only standardized rating scale for the appraisal of a personality trait was that devised by Marston for the measurement of introversion-extroversion in young children.

In contrast, the last few years have witnessed the development of a host of devices intended to give insight into the inner life of the individual. The loose descriptive terms and the casual observation and inference that were formerly relied upon in attempting to account for the development of particular types of personality are rapidly giving way to more precise concepts that can be verified by direct experiment. The use of such terms as the "level of aspiration" has not only broadened our understanding of the nature of personality but has made it more dynamic and realistic.

The volume of recent work in this field is so great that anything approaching a complete list of the bibliographies that have appeared, especially those on highly specialized topics, would be of impracticable length. We have therefore aimed at selecting a relatively small number that are fairly recent and inclusive. While this has meant the omission of many excellent summaries it is hoped that the more important references, at least, have been included in the lists here cited.

No general section dealing with attitudes and interests of children was provided in Allen's summary of 1931, but he has a special section on play. Although the number of good bibliographies on the genetic aspects of this topic are few, the literature shows promise of a growing interest. Murphy, Murphy, and Newcomb (**129**), Jones and Burks (**116**), Hildreth (**78**), and Buros (**74**, **75**) provide the best source material on this subject.

Research workers are especially interested in studying children's attitudes toward their parents and toward school as well as their general social attitudes. The widespread concern over vocational guidance has led to the preparation of a number of vocational interest inventories during the last decade. New techniques of measuring and scoring attitudes and interests have also been developed. The searching review of the literature on infancy and early childhood by Sears (**134**) with view to testing the psychoanalytic theories of infantile sexuality deserves special mention.

Infancy, including the prenatal and neonatal periods. For at least two decades, the periods of infancy and adolescence, because of the rapid development and specialized changes that take place at those times, have stimulated much scientific interest among anatomists and psychologists alike. A number of excellent bibliographies on the prenatal and neonatal growth and behavior of infants have recently been compiled, including a translation of Preyer's early monograph which includes an excellent bibliography made up chiefly of German titles (**153**). Psychological interest is for the most part focussed upon the study of prenatal and neonatal reflexes, the development of the nervous system and the responses of the sense-organs. Another area of interest is that of premature birth and its effect on subsequent physical and mental development. General reviews of the literature on the neonatal and early postnatal periods have been published by Cattell (**142**), Dewey (**143**), the Shermans (**156**) and by Valentine and Dockeray (**159**). The literature in this area thus reflects a change from *general* observational treatment of prenatal and neonatal behavior to a concern for specific phenomena which, when understood, may have significant implications for later development.

Adolescence. Mill's very thoroughgoing survey of the literature on the age of the menarche (**168**) has exploded the old theory, still stated as a fact in many medical texts, that girls in warmer climates mature earlier than do those in the north. The excellent series of reports based on the Harvard Growth study will serve as models in this field for years to come. Reports from the extensive study of adolescence carried on at the Institute of Child Welfare of the University of California are just beginning to appear; it is to be expected that this investigation will provide much valuable information in the near future.

Exceptional Children. We have included a brief list of bibliographies on atypical children in spite of the fact that the topic falls somewhat outside the limits originally set, because of the fact that examination of the literature shows that a rather large proportion of the books and articles cited have adopted a genetic approach. The blind, the crippled, or the deaf child is no longer considered as a static type but as a growing individual.

The annotated bibliographies on this topic that appear annually in the May number of the *Elementary School Journal* cover the current literature fairly thoroughly. Of the bibliographies on special topics, probably the most comprehensive is that by McIntyre (**180**) on cerebral birth palsy.

Children in wartime. The systematic and large-scale evacuation of children from target areas is a practice as new in the history of mankind as is a war fought largely in the air. It is but natural, therefore, that doctors, psychologists, sociologists and others concerned with the welfare of children should attempt to study the effects of evacuation and of the war itself upon children. Although most of the studies thus far have not gone beyond the level of casual observation and anecdote, a small amount of material based on clinical observations and tests, medical data, and more or less quantitative psychological and physiological research has appeared. At the time this article was written, Despert's monograph (183) represented the nearest approach to a systematic covering of this material but the appearance shortly thereafter of a more complete review and bibliography by Jersild and Meigs (185) requires special mention.

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THE MECHANISM OF MONOCULAR ACCOMMODATION IN MAN

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Helmholtz's theory of monocular accommodation (11), which psychologists endorse often without expounding, is essentially as follows. The organ of accommodation is the lens, which modifies the accommodative power of the eye by changes in its shape. The change in shape occurs mostly in the anterior surface, and is caused by complex relations between the ciliary muscle, the suspensory ligament, and the elastic nature of the lens itself. Thus, when the circular fibers of the ciliary muscle are relaxed, the lens is stretched out by the tensions conveyed through the suspensory ligament, and the eye is accommodated for distant vision. When the ciliary muscle contracts, the diameter of its inner circle is decreased, thus releasing the tension of the suspensory ligaments, and permitting the elastic lens to increase its curvature as required for accommodation for near vision.

The major view in opposition to Helmholtz is that of Tscherning (22, 23) and his pupils. This theory denies that the lens is an elastic body. Accommodation, they hold, is due to changes in the lens curvature brought on by an active pressure initiated by the contracting ciliary muscle. When the ciliary body contracts it puts a tension on that part of the suspensory ligament that is attached to the forward surface of the lens, thus pulling the lens backward; but at the same time, the contraction pulls the choroid in and compresses the vitreous humor such that the vitreous presses against the back of the lens. The resultant of these pressures keeps the lens in place but forces it to bulge at its anterior pole. Thus the item at issue between Helmholtz and Tscherning is whether or not the lens is elastic (or the lens capsule); or stated another way, whether or not the contraction of the ciliary muscle *allows* the lens to increase its convexity, or *forces* it to assume the proper shape.

From an inspection of texts in physiological psychology and some in general psychology, one can gain the impression only that the question of the mechanism of accommodation was settled once for all by Helmholtz, and that nothing of significance has appeared since his formulation. One would never know from these texts that he had antagonists to his theory of accommodation just as he had opponents to his theory of hearing and to his theory of vision, and that these opponents had some ground for their opinion. Yet the work of this line of investigators has been persistent and has now built up a challenging body of factual evidence which calls the great master in question, just as he has been challenged, and modified or reversed, in other fields. Let us examine some of these texts.

Ladd and Woodworth's Elements of Physiological Psychology (14), the standard for many years, describes the Helmholtz notion and does not mention Tscherning. Troland's accounts, both in Murchison's Foundations of Experimental Psychology (20), and in his Principles of Psychophysiology (21) mention only Helmholtz. Freeman's Introduction to Physiological Psychology (8) has no mention of accommodation in the index. Rawdon-Smith's Theories of Sensation (19) is about like Ladd and Woodworth in this connection. Both Dunlap's Elements of Psychology (6) and Boring, Langfeld and Weld's Psychology (2) describe the Helmholtz theory as though it were a matter of established fact. Boring's Sensation and Perception in the History of Experimental Psychology (1) devotes 10 pages to the subject of accommodation, but never gets beyond the mention of Helmholtz's notion of the elastic lens.

There have been, however, a number of experiments reported in the last 40 years the results of which make it appear that the Helmholtz notion must be modified.

A general survey of the literature up to 12 years ago is provided by Duke-Elder in his Recent Advances in Ophthalmology (4), and his compendious Textbook of Ophthalmology (5). He cites the work of Fincham who showed that the lens itself is not elastic, but maintained, however, that the capsule was. He showed that the lens capsule is not of the same thickness at every point, being thickest at the shoulders, and thin at both posterior and anterior poles. This becomes important in terms of his findings as to the shape of curvature of the lens in accommodation. Fincham showed as Grossmann had done in 1904 (10) that in accommodation the lens thickens, but that at the anterior surface it assumes a hyperbolic curve with the apex rounded out, corresponding to the pupillary diameter. At the periphery it tends to flatten.

Duke-Elder also cites the work of Graves (9) who experimented upon a lens capsule which had been so injured that it was like an empty sack. He reported that when accommodated for distance, or under the effects of mydriatics, the lens capsule straightens out; but that when accommodated for near vision, or treated with eserin, the capsule wrinkles and folds, the posterior more than the anterior, like a slack sail.

It was shown by Johnson (12), contrary to Fincham's belief, that the lens does not appear to have great tension; if it is cut open it does not gape as it should, if elastic. He also reported that the fluids in the chambers apparently moved about, as could be seen following the injection of methylene blue into the chamber.

Duke-Elder summarizes as follows (5):

> In the act of accommodation there is an increase of thickness and a decrease

in diameter of the lens, with, at the same time, a protrusion forwards of the center and a relative flattening of the periphery, the whole being accomplished by an axial movement of the lens substance which is evident particularly in the central regions (p. 745).

Further, he states the Helmholtz theory must be modified to take account of the hyperbolic form of the accommodated lens at the anterior surface, and the fact that the lens substance is not elastic (p. 747). He holds with Fincham that the lens capsule is elastic and responsible for the lens shape.

Edgar Fincham has published a number of careful and significant studies, most of which are brought together in a monograph with an extensive bibliography, published in 1937 (7). He points out that the ciliary muscle is not a true sphinctor, but is made up of reticulated and not radial fibers. The lens is connected to the walls of the eye ball by the zonule and the vitreous humor; and the zonule is actually a modification of the vitreous as an elastic gel membrane, and not a system of inextensible fibers. The lens itself is of increasing hardness as the center is approached, due to a decrease in water content in the older tissues; and it also increases in refractive index. The lens, however, is not *elastic* as is shown when the substance is slipped out of the lens capsule. Fincham's evidence for the elasticity of the capsule makes it appear to be much less elastic than his enthusiasm for this property warrants. He offers four major facts. One is that if a strip of the capsule is cut, it coils outward, and if a wound is made, the capsule at the edges rolls outward and the lens substance protrudes. The second fact comes from two cases of aniridia, wherein the whole lens, the ciliary body and zonule were visible. In accommodation the apparent diameter of the lens is reduced, and there is a marked centripetal movement of the ciliary process, which is not visible in the unaccommodated state. The inward movement of the ciliary body is more than the amount of movement of the edge of the lens. The third fact is Graves' report (which is cited above) of the alteration of the lens capsule in accommodation, in which the lens had been dissolved. Finally, he reports the effect upon the lens of completely severing its connection with the zonule. In an eye of an 11 year old he removed the cornea and iris, and with a Graefe knife, loosed the lens; he also bisected the eye at the equator so that the anterior half was supported with the lens resting upon the vitreous humor. Thus, he finds, that before severing the zonule, the radius of curvature of the lens is about 12 mm., and after severing, the central part (3 mm.) has a radius of curvature of about 5 mm., while the periphery is still 12 mm. Such a conoidal form of lens surface, he demonstrates, is found only in cases where the anterior capsule has a relatively thin central area surrounded by a zone of greater thickness.

The evidence cited above seems not to be final, or crucial between the theories of Helmholtz and Tscherning. Although Duke-Elder, Fincham, and many others interpret this in terms of a modified Helmholtz view, it is interpreted to support Tscherning in a series of papers by Luedde (**15**, **16**, **17**, **18**) and by Koke (**13**).

Luedde (**16**) points out that the vitreous humor has a structure and that it works on the lens not only through hydrostatic pressure. Thus, "when the vitreous pushes against the lens, with its mushy cortex and unyielding nucleus at its center, changes are likely to occur in the lens. The soft cortex will be pushed forward and axipetally, and increased convexity of the anterior surface will result. Under extreme accommodation the lens may shake and quiver, because it carries with it the attached body of the vitreous," and not because it is simply released from tension, as followers of Helmholtz would have it.

In his last paper, Luedde (**18**) presents some clinical material of considerable additional importance. He reports several cases of subluxated lenses which he treated. He had employed miotics to prevent a recurrence of prolapse of the lens into the anterior chamber. But the lens gradually displaced downward behind the iris. He discontinued the use of the drug, and the lens arose to the original position. He cites other cases, in all of which *the lens tends to be displaced in the direction of the section of the zonule which is left intact.* This cannot be accounted for, he maintains, by the theory that the zonule is *relaxed* from tension; the lens displacement he explains as a function of the action of the ciliary muscle which causes an impact by means of the vitreous humor against the periphery of the lens. He thinks that the vitreous slipped over the edge where the zonule was defective and caused the side-slip of the lens. But the clinching case, reported by his son, was a subluxation of a lens caused by a football injury. Iridodonesis was present when looking at a distant object, but stopped upon accommodation for near objects. He found that with the good eye, the boy's accommodation for near vision was 6 inches, but for the injured eye, only 9 inches. Obviously there could be no relaxation of tension in accommodation here.

An experimental study reported by Koke (**13**) seems also to be crucial. He made a cat's eye radiopaque by interocular injection of a colloidal suspension of thorium dioxide, and then took roentgenograms of the eye under the influence of different drugs. He describes in detail the structure of the vitreous humor. He maintains that during accommodation, changes are mostly found in the increased axial diameter of the lens and an axialward forward movement of the tertiary vitreous. He holds that the sphinctor-like action of the ciliary muscle rolls the tertiary vitreous inward and upward against the center of the lens, and backward against the secondary vitreous nearer the periphery. The secondary vitreous tends to expand at the ora serrata but is prevented from doing so by the attenuated posterior extremity of the ciliary muscle (p. 967).

During maximal accommodation the lens trembles on movements of the eye because the circular muscle fibers relax the anterior zonule more than the lens capsule constricts, leaving, as has been explained by Luedde, the lens to be supported only by the zonular fibers attached to the posterior portion of the ciliary epithelium (p. 968).

He concludes that in this cat eye, accommodation is brought about by compression of the posterior periphery of the lens when the tertiary vitreous is forced anteriorly and axialward by the ciliary muscle.

From these various studies it would seem justified to say that in certain respects both the Helmholtz and the Tscherning theories of accommodation are right. The lens itself is not elastic material; but the lens capsule has a structure such that it tends to shape the lens; and such that, when pressure is applied to it, it does not give uniformly. In the peripheral regions the greater thickness of the capsule acts as a stiffener, thus containing the bulge from the posterior pressure to the central anterior region, forming a *lenticonus*. When relaxed and accommodated for distance the lens seems to be under some flattening tension. But when the ciliary muscle contracts it does not simply release the tension on the zonule; it applies positive if indirect pressure against the lens through its action on the structured vitreous humor.

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HULL'S TREATMENT OF LEARNING

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In a recent review of Hull's new book, *Principles of Behavior* (10) in the *Psychological Bulletin*, Professor Sigmund Koch (11) says: "It is one of the most important books published in psychology during the twentieth century" (11, p. 269). This statement is followed by fourteen successive pages of similarly unrestrained praise. The review closes with three pages of hesitant criticism. Professor Koch's enthusiasm seems to be based upon the belief that the book states "the *entire* postulate set tentatively believed to be capable of generating the major phenomena of organismic behavior" (11, p. 270). The review itself is primarily concerned with the logical elegance of Hull's system, and Professor Koch's few criticisms deal with certain logical or mathematical inelegancies. When, however, one considers the relation between Hull's system and the facts of learning which it is supposed to explain, enthusiastic praise seems out of place.

When the original announcement of Hull's book was made, one was led to expect a detailed analysis of the work of his critics, and a reformulation of his basic explanatory hypotheses so as to account for the experimental data which they had discovered. But this expectation was doomed to be disappointed. There are, for example, no references in Hull's book to the work of Muenzinger, Krechevsky, D. K. Adams, Brogden, Culler, Harlow, Hunter, Loucks, or Maier, to mention only the more prominent proponents of experiments which are critical of Hull's theories. This false expectation was furthered by the appearance, shortly before the publication of the *Principles*, of an article (9) in which Hull announced his adoption of (1) Tolman's program of molar as opposed to molecular analysis, and (2) Tolman's explanatory device which has been called the *intervening variable*.

But a mere cursory glance at Hull's *Principles* shows that his attempt at molar analysis is hardly thorough-going. Of the total number of experiments cited, 26 or 41% are of the classical Pavlovian type, using the psycho-galvanic reflex, salivation, or the eye-blink. On the other hand only 2 maze and 2 visual discrimination experiments are cited. Thus Hull seems to have become less, rather than more molar. Furthermore since his analysis is concerned with such small segments of behavior, there is no detailed discussion of his highly important and most controversial notions, such as the anticipatory goal response, the habit family hierarchy, and the goal gradient. Instead of analyzing these notions he casually uses them to explain any behavioral anomalies which cannot be accounted for by simple effect or substitution principles.

Because Hull, in his search for formal elegance, has apparently ignored the work of his critics, his book has little to offer the student who is concerned with contemporary problems in learning theory. Although Hull makes several references to Hilgard and Marquis' *Conditioning and Learning* (6), he makes no attempt to solve any of the problems which that book presents for his theory. The chief defects in his theory of learning spring, I believe, from two sources, his molecular bias, and his inadequate treatment of reinforcement. Let us turn then to some of the basic problems in learning theory and examine Hull's treatment of them.

1. *Behavioral Oscillation and Response Generalization.* Perhaps the most striking evidence that Hull has become less rather than more molar is to be found in his treatment of response generalization. Previously he had dealt with this problem in terms of his notion of the habit family hierarchy (8). Each member of a habit family was thought of as a response sequence leading from a common starting place and ending at a common goal situation. "When one member of a habit family has attained a goal in an objectively novel situation," Hull said, "the learning thus acquired is transferred without specific practice to the remaining members of the hierarchy" (8, p. 41). Now there may be disagreement about the usefulness of such a molar concept, but certainly no one can deny that it is more molar than Hull's present notion of behavioral oscillation. Compare the quotation we have just cited with the following *explanation* of response generalization taken from the *Principles*.

> The explanation lies in the tendency of the oscillation function to modify the intensity of every muscle contraction involved in every coordinated reaction. (10, p. 318).

Note also the following statement of what he means by the term *molar*, drawn from the same chapter.

> The ultimate effector molar unit in habitual action is believed to be the individual muscle. This means not only that the action of each muscle in every coordinated movement must be mediated by a separate habit, but that every momentary phase of the contraction of every such muscle (since its proprioceptive cues are constantly changing) must be mediated by what in some sense is a different habit. (10, p. 315).

It is difficult to imagine how such a molecular notion could explain, say, the behavior of Lashley's (12) monkey which solved a problem of manipulation with its left hand, despite the fact that the right hand, the only one to receive any training, had been paralyzed by a brain operation. Such results as these are not scarce and seem to demand that we give up the notion of habits as simple receptor-effector connections.

This point was apparently recognized by Hull when he developed the habit family hierarchy notion. But in his *Principles* he has abandoned this program, and has regressed to a muscle-twitch *peripheralism* (2).

2. *Stimulus Patterning.* Just as Hull's "explanation" of response generalization reveals a peripheralism on the response side, so his "explanation" of stimulus patterning reveals a parallel peripheralism on the stimulus side.

The facts of stimulus patterning were first discovered in Pavlov's laboratory and were later confirmed by C. B. Woodbury (20) in the New Haven laboratory. Woodbury's experiment consisted in training dogs by differential reinforcement, to lift a bar (a la Skinner) when either a high or low buzzer sounded alone, but not to lift it when they sounded together. It is a little surprising, says Hull, that Pavlov "regarded patterning as an ultimate molar phenomenon and did not succeed in breaking it down into more elementary principles" (10, p. 354). No one, according to traditional conditioning theory, Hull implies, could explain how two conditioned stimuli in combination could lose their power to evoke a response, so long as each separately would still evoke it. Hull bases his explanation on his *principle of afferent neural interaction* which asserts that the afferent impulses from receptor discharges interact with each other so that each is changed by the pattern of the others. Thus the afferent impulse resulting from the high buzzer when sounded alone is different from the impulse produced by the same buzzer when it is sounded in combination with the low buzzer. If a response is conditioned to the solitary impulse it will at first generalize to the other similar impulse, and the response will be made to the compound. However, as a result of differential reinforcement the dog can learn to discriminate between these two afferent impulses, and thus respond to the stimulus, only when it is presented alone. This explanation of stimulus patterning is, says Hull, an answer to the criticisms of the configuration or *Gestalt* psychologists who take such patterning as logically primitive. As a consequence Hull thinks of it as an important new addition to behavior theory.

Unfortunately, however, neither the importance nor the novelty of this explanation are so obvious. To explain observable phenomena in terms of unobservable ones is often permissible and sometimes fruitful. But unobservable phenomena should not be confused with *uncontrollable* ones. Since we can control such unobservables as drive by maintenance schedule, or habit strength by training, we may employ these constructs as intervening variables to *explain* the gross behavior reported in our protocols. But in the principle of afferent neural interaction we have no way of estimating, for example, the degree of similarity between the compound afferent impulse and its component impulses when taken separately. Any such estimation must perforce be ad hoc, and thus the principle appears to be what Spence (**18**) has rightly criticized as a *response inferred construct.* Therefore, we must conclude with Spence, that its explanatory value is negligible.

Secondly, Hull's explanation is hardly novel. In fact it does not seem to differ essentially from Pavlov's which emphasized "that a definite interaction takes place between different cells of the cortex resulting in a fusion or synthesis of their physiological activities on simultaneous excitation" (**15**, p. 144). It seems unfair therefore to say that Pavlov did not foresee Hull's explanation.

Finally the fact that Hull's treatment of this problem is not molar hardly needs mentioning. In fact, for the molar psychologist there is no problem in stimulus patterning. The compound of the two buzzers is a different physical object from either of them taken separately, and consequently learning to discriminate the compound from the other two objects is not theoretically different from any other learning of a discrimination.

3. *Conditioned Inhibition and Extinction.*—Most of the difficulties in Hull's *Principles* arise from two sources (1) its molecular bias, which we have described, and (2) its inadequate notion of reinforcement, which we will analyze later. His treatment of extinction and conditioned inhibition is important chiefly because it illustrates these sources of difficulty.

Extinction is explained in terms of the Mowrer-Miller hypothesis of reactive inhibition (**13**, **14**). According to this hypothesis whenever a response occurs there is deposited "in the physical structures involved in the evocation, a state or substance which acts directly to inhibit the evocation" (**10**, p. 297) of this response when its stimulus is again presented. Reinforcement cannot destroy or remove this reactive inhibition, which continues to accumulate with each repetition of the response. It is only dissipated when the effector organs are allowed to rest and the "inhibitory substance is gradually removed by the blood stream passing through these organs." (**10**, p. 281). Hull emphasizes that such inhibition is opposed to reaction potential and not to habit strength, which is not weakened by extinction. That is, it is the response and *not* the connection between the stimulus and this response which is weakened. Extinction is thus primarily motivational in nature and is not like "forgetting" since the habit remains unimpaired. With an increase in motivation for example, the reaction potential of an extinguished response is increased, and the response reappears.

Habits are involved, however, in *conditioned inhibition,* a process closely allied to extinction. Hull's *explanation* of it is strangely recondite. Reactive inhibition, he now asserts, is a primary *negative motiva-*

tional state (**10**, p. 281), which is analogous to tissue injury or pain. Consequently with the cessation of reactive inhibition we should expect to have a reinforcing state of affairs. He goes on

> The response process which would be most closely associated with such a reinforcing state of affairs would obviously be the cessation of the activity itself. In accordance with the law of reinforcement this cessation of activity would be conditioned to any afferent stimulus impulses, or stimulus traces, which chanced to be present at the time the need decrement occurred. Consequently there would arise the somewhat paradoxical phenomenon of a negative habit, *i.e.*, a habit of *not* doing something. (**10**, p. 282).

This new *habit* is in conflict with the old one, and as its strength increases, it overtakes and outruns it. In this sense then, conditioned inhibition is closer to *forgetting* than extinction since it is a special case of counter-conditioning in which the new habit is a habit of *not* doing something.

The hypothesis that extinction is probably motivational in nature lies at the basis of every adaptation theory of extinction. And for such an hypothesis there seems to be much evidence. But Hull has failed to see that this hypothesis is incompatible with his molecular notion of habit. That is, he completely ignores the logical difficulty in maintaining that a receptor-effector connection (a habit) can remain unchanged when properties of its effector are changed (i.e., the reaction potential is reduced). As a consequence if Hull is to retain his interpretation of extinction, he must abandon (1) his notion of habit as a connection between receptor and effector events, and (2) his notion that reinforcement strengthens such connections. In a later section of this paper we will discuss this difficulty in greater detail.

All that one can conclude from Hull's *explanation* of conditioned inhibition is that his notion of reinforcement is confused. Reactive inhibition, one must remember, is only dissipated by being *gradually* washed away by the blood stream, a process which takes many hours. The cessation of this state, says Hull, constitutes a reinforcing state of affairs. But if the gradient of reinforcement is limited, as Hull says, to 20 or 30 seconds, it is impossible to understand how removal of this state could be a reinforcing agent. This confusion is even further increased by the ambiguity in the phrase *cessation of activity*. This might mean (1) a single act of restraining the old response, or (2) the fact that the response will not be repeated for many hours. If Hull means the first, then it is clear that this response of restraint could not be reinforced by a process which occurs only after many hours. If he means the second, then there is nothing to explain, since he has already assumed that the habit-of-not-making-the-old-response has already been acquired.

4. *Primary Reinforcement and Avoidance Learning.* Since Hull's law of primary reinforcement is based upon the Thorndikian law of effect, it is interesting to examine his account of avoidance learning. Hilgard and Marquis (6) have shown that the traditional formulations of effect have not been able to explain such learning. Briefly put the problem is this. Although the shock is an essential condition in acquiring the avoidance response, once this response has been acquired, reinforcement consists in *not* getting the shock. Hull does not discuss this point, but instead presents two paradigmatic experiments, intended to exemplify the nature of primary reinforcement.

The first such experiment involves escape learning. A rat is put in a box with electric grid floors. This box is divided into two compartments by a little fence, so that if the rat is to get from one compartment to the other he must jump the fence. After the rat is put in the box, the experimenter throws a switch which charges the floor on which the rat is standing. The rat's behavior changes immediately. Hull says

> In place of the deliberately exploratory movements, it now displays an exaggeratedly mincing form of locomotion . . . interpsersed with occasional slight squeaks, biting of the bars which are shocking its feet, defecation, urination, and leaps up the walls. These reactions are repeated in various orders and in various parts of the compartment; sometimes the same act occurs several times in succession, sometimes not. After five or six minutes of this variable behavior, one of the leaps carries the animal over the barrier to the uncharged grid of the second compartment. (10, p. 70).

As this procedure is repeated the rat learns to jump over the barrier the instant the grid is charged.

Hull analyzes this situation as a case of selective learning in which one unlearned receptor-effector connection (leaping over the barrier) is made stronger than its competitors. Of the variety of competing responses, R_1 (leaping against the walls), R_2 (squeaking), R_3 (biting the floor), and R_4 (leaping over the barrier), the last is strengthened on each trial while the others remain at their initial strength. Each of these competing responses was originally evoked by (a) the conditions of need resulting from electric shocks on the feet, and (b) stimulation (visual, cutaneous, etc.) arising from the apparatus at about the time the reaction took place. Hull says

> This stimulation, arising from the apparatus at the time of the respective reactions needs to be designated specifically; leaping against the walls will be represented by S_A; biting by $S_{A'}$; squeaking by $S_{A''}$; and the leaping of the barrier by $S_{A'''}$. It is assumed that preceding the learning, the leaping of the barrier was evoked by a compound connection between the receptor discharges S_D (internal drive stimulus) and $S_{A'''}$, arising from S_D and $S_{A'''}$ respectively. (10, p. 71).

Hull then explains the differential strengthening of the correct response in terms of the following law of reinforcement:

> Whenever a reaction takes place in temporal contiguity with an afferent impulse resulting from an impact upon a receptor of a stimulus energy, and this connection is followed closely by the diminution in a need (and the associated diminution in the drive, and in the drive receptor discharge), there will be a resultant increment in the tendency for that stimulus on subsequent occasions to evoke that reaction. (**10**, p. 71).

The second paradigmatic experiment involves avoidance learning. The procedure is the same one as in the preceding experiment with the exception that two seconds before the shock, a buzzer is sounded. Selective learning proceeds as before, but ends with the animal jumping as soon as the buzzer sounds, thus avoiding the shock. This learning is, in principle, says Hull, exactly the same as the previous kind of learning. The reinforcement again consists in the termination of a need. Hull explains the fact that the animal does not have to wait for the shock to occur, by saying that the S-R connections between buzzer-and-jump and between $S_{A'''}$-and-jump summate physiologically and thus become strong enough to evoke the jumping response without the shock.

It is difficult to see that Hull's account of primary reinforcement represents any improvement over Thorndike's. It still fails to explain why the avoidance response does not extinguish once the animal has learned to avoid the shock. Since he defines reinforcement as a reduction in a need, it is necessary that the rat have some need reduced after each repetition of the correct response, if the reaction potential is not to decrease and end in extinction. Previously, Hull (**7**, **8**) used the notion of r_g to account for this, although that explanation was also inadequate, since it failed similarly to explain why the r_g continued to be evoked without reinforcement. Perhaps because of this difficulty he has given up the r_gs, but as far as I can see he has not here found a better solution to the problem.

Furthermore Hull's insistence that such learning involves differential strengthening of certain receptor-effector connections seems merely to make his theory of reinforcement less plausible than the traditional one. The stimuli which Hull supposes arise from the apparatus and evoke the various unlearned responses, are inferred solely from these responses. They are not themselves observable, or at least they are not experimentally controllable. Consequently they have a dubious status as constructs. Other proponents of effect theories, such as Thorndike and Skinner have avoided this difficulty. Thorndike avoids it by saying that all the competing responses are initiated by the same stimulus. Skinner avoids the difficulty by saying that they are operant responses which need no external stimuli to instigate them. But Hull supposes that the stimulus for squeaking, for example, is different from the stimulus for jumping the barrier. There is, as he puts it, the stimulus "which arises from the apparatus at the time of" squeaking, and another stimulus which arises at the time of leaping the barrier. This ambiguous statement leads the reader to suppose that perhaps the only stimuli which are peculiar to the leaping response are those proprioceptive and exteroceptive stimuli which result when the animal makes the response. Of course Hull does not state this to be his meaning, but it is difficult to conceive of any other way of distinguishing these stimuli. But this interpretation makes the explanation completely circular, since the stimulus which is supposed to evoke the leaping response, only occurs after the response has been made. The other alternative, namely Thorndike's solution, which states that the external stimulus is the same for all the responses, is not compatible with Hull's theory. The reason is that all four of the unlearned habits would then be reinforced because of their close temporal contiguity to the reinforcement, and consequently the incorrect ones would tend not to be eliminated.

5. *Secondary Reinforcement.* Hull recognizes that direct or primary reinforcement will not account for a "very great deal of learning" (**10**, p. 84). Perin's experiments (**16**), on the temporal gradient of reinforcement in the Skinner box situation, show that this gradient is limited to 20 or 30 seconds. Consequently, Hull says, a new principle is needed to explain the learning of long sequences of behavior (e.g. in mazes) where direct reinforcement cannot be effective. "Fortunately," says Hull, "an ingenious series of experiments performed in Pavlov's laboratory in Petrograd has yielded a principle which explains these remote reinforcements." (**10**, p. 84). He then describes in detail Frolov's experimental discovery of higher order conditioning. Dogs learned to salivate to a black square which had never been followed by food, but had instead been followed by a metronome which elicited conditioned salivation because of previous training in which it had been followed by food. This experiment, according to Hull, "demonstrates in an unambiguous manner the genuineness of secondary reinforcement, a first rate scientific achievement" (**10**, p. 86).

Hull goes on to describe other experimental illustrations of such secondary reinforcement. Skinner (**17**), for example, trained rats to press a lever when it was reinforced not with food, but with a click in the food-release mechanism, which by previous training had been associated with food. Bugelski (**1**) showed that the rate of extinction was retarded when such a click followed the lever pressing, although no food was delivered. Further examples are found in Cowles' (**3**) token experiments with apes, and Grindley's (5) experiment in which he taught young chicks to go down a runway and peck at grains of boiled rice which were covered by a glass plate.

But none of these experiments according to Hull "prove that secondary reinforcement is a genuine phenomenon." In order to prove *that*, "it is necessary to remove all possibility of primary reinforcement from the situation" (10, p. 94). However, when we do this, the primary receptor-effector connection extinguishes, and the secondary reinforcing agent becomes impotent. Because of this fact Pavlov believed that conditionings above the third order were impossible. Thus, none of these experimental illustrations provide evidence of stable learning in which the effect of direct reinforcement is completely removed. However, Hull says

> We now have evidence, that in protracted behavior sequences, even with primary reinforcement fully intact, the direct effects of the latter are automatically excluded from all receptor-effector conjunctions beyond a half minute or so from the point of such reinforcement. . . . It follows that the strength of the earlier segments of such sequences must frequently be maintained by very long chains of secondary reinforcing situations. (10, p. 94).

This *explanation* of secondary reinforcement certainly seems circular. As he states it, his original problem is to find an explanatory principle which will account for the learning of protracted behavior sequences in which the earlier segments lie outside the gradient of primary reinforcement. He then described one higher order conditioning experiment, and several secondary reward experiments. But since none of these yield an instance of learning which is unambiguously independent of primary reinforcement they are not satisfactory. Finally, the only conclusive evidence of the *genuineness* of secondary reinforcement is the fact that animals can learn such protracted behavior sequences.

Perhaps the real trouble with this argument is that Hull is not clear about the nature of an explanatory principle. Hilgard and Marquis (6) for example, distinguish three such principles, substitution, effect, and expectancy. They do not point out, however, that the first two of these principles differ from the last one in an extremely important way. Both substitution and effect state, or attempt to state, the necessary and sufficient conditions for the acquisition of a new habit (however that term is to be defined). Substitution states that temporal contiguity between the conditioned and unconditioned stimulus is the only relevant condition. Effect, on the other hand, states that the critical condition for learning is the temporal contiguity between the occurrence of the response to be learned and the reduction in a need. The principle of expectancy, on the other hand, states that an expection of "this-leading-to-that" is the necessary and sufficient condition for learning, but it fails to state the conditions leading to such an expectation. In this sense the expectancy principle is fundamentally different from either substitution or effect. The importance of the expectancy principle lies in its emphasis upon the role of attention (as in Krechevsky's theory of discrimination learning) and the role of spatial orientation (as in the latent learning experiments). But the principle of expectancy will only become explanatory when it has become possible to state the conditions leading to such attention, orientation, and whatever other factors may prove relevant.

Thus, Hull's explanation of maze learning in terms of secondary reinforcement is, strictly speaking, empirically equivalent to Tolman's explanation in terms of expectation. Both serve to point out that neither the principle of substitution nor the principle of effect are adequate. But neither Hull nor Tolman can state the necessary and sufficient conditions for the occurrence of such expectations or such secondary reinforcements. Despite this similarity between Hull and Tolman there remains, however, an important difference. Tolman recognizes that expectancy is not an explanatory principle, but rather is merely a device for "casting one's concepts into a mold such that one can derive useful preliminary hunches from one's own human, everyday experience. These hunches may then, later, be translated into objective terms" (**19**, p. 24). By this means Tolman believes that we may be able to discover the conditions which determine attention, spatial orientation and so forth. Hull, on the other hand, since he seems to conceive of his principle as explanatory leaves the reader with the notion that nothing remains to be done but to express it in mathematical form.

In some terminal notes Hull considers the possibility that primary and secondary reinforcement are at bottom the same. Although the ultimate proof must be physiological, he suggests that an analysis in terms of fractional anticipatory goal responses seems to indicate a basic identity between the two kinds of reinforcement. The basic assumption of this analysis is that

> the first secondary reinforcing stimulus acquires its power of reinforcement by virtue of having conditioned to it some fractional component of the need reduction process of the goal situation *whose occurrence wherever it takes place, has a specific power of reinforcing in a degree proportionate to the intensity of that occurrence.* (**10**, p. 100).

But this analysis is inadequate since it cannot explain the elimination of errors. Because the goal component response is conditioned to the drive stimulus it is independent of external supports and may occur anywhere in the maze. It may occur in the blinds as well as in the true path. Since this is the case, the responses which carry a rat into a blind are just as likely to be reinforced as those which carry it into the true path. Previously Hull tried to meet this difficulty by saying that the goal component responses on the true path were stronger and more frequent than those in the blinds because of their greater proximity to the goal. But this explanation is based on the assumption that the gradient of primary reinforcement operates throughout the entire maze, an assumption which Hull no longer considers tenable.

6. *Habit Strength, Reaction Potential, and Reinforcement.* So far we have examined some of the more important difficulties which result from trying to account for molar behavior in terms of a molecular notion of habit combined with a Thorndikian notion of reinforcement. In a molar psychology like Tolman's such problems do not arise. Basic to a theory like Tolman's is Elliott's (4) distinction between learning and performance, as exemplified in the phenomenon of *latent* learning. This idea emphasizes that what is learned is not a tendency to respond in some particular way, but rather, is a *cognitive* grasp of certain means-end-relations. Consequently, whenever the animal is motivated in such a way that certain objects in this means-end field become goals, the animal then performs, by responding in a way that is directed or determined by the character of the means-end relations which were acquired during the "latent" learning period. Although such a theory may face new difficulties of its own, it does obviate most of those which face a theory like Hull's.

Hull's distinction between habit strength and reaction potential was probably conceived to serve the same purpose as the distinction between learning and performance. In fact the idea of reaction potential may have been derived from a suggestion made by Tolman (**19**) in his presidential address. In that paper Tolman said:

> So long as there is no appetite for what is found at the end of the maze, strong demands plus strong hypotheses do not add up at all. A strong hypothesis and a strong demand do not compensate for a weak appetite. And a strong demand and a strong appetite cannot in their turn overcome a weak hypothesis. (19, p. 21).

Hull, agreeing with this suggestion (whether stimulated by it or not), devotes a chapter to pointing out that an active motive must be present for a stimulus to evoke its response. Such response evocation is a multiplicative and not an additive function of the drive and the habit strength, so that *reaction potential, the tendency to produce the response,* is defined as the product formed by multiplying the strength of the drive by habit strength. Thus the tendency to make the response is a direct function of the amount of motivation and of learning at the time the stimulus is presented. If either of these is zero, the reaction potential will be zero.

Such a conception is very useful to Hull since it enables him to account for much of the experimental data which Tolman and others have emphasized. But unfortunately if Hull is to use this distinction, he must revise his notions of habit and reinforcement. Reinforcement, according to Hull, produces an increase in habit strength or an increase in the "tendency for an afferent impulse on later occasions to evoke that reaction" (**10**, p. 178). While habit on the other hand is defined as this receptor-effector connection. Now in terms of these two notions, observe the logical difficulty involved in his explanation of experimental extinction. Hull says that during extinction the habit strength remains unchanged while the reaction potential is weakened. When "translated" this means that the habit (i.e., the tendency of a particular afferent impulse to evoke its habitual reaction) remains unchanged, while the reaction potential (i.e., the tendency to this same habitual reaction) decreases. Clearly this is contradictory. Therefore, if Hull is to make his theory consistent he must either give up the notion of reaction potential, or completely revise his ideas about habit and reinforcement.

Professor Koch says

> It is easy to point to many aspects of the system which are incomplete, based upon tenuous experimental foundations, or lacking in rigor. But in most cases this would not be news for Hull. So clearly is Hull aware of the *provisional* character of his formulation, and the presence in the system of many open questions, that one hesitates to raise critical points. (**11**, p. 283).

But, easy as it is to discover the faults in Hull's system, it is not a simple matter to correct them. The criticisms raised in the present paper are certainly not novel. If Hull has followed the discussions of his theories, which have filled the journals since 1930, he must certainly be familiar with all these difficulties. But to change his system to account for these criticisms probably would mean such a radical revision of the foundations that there would be little left upon which to build.

Hull and his students have constantly criticized other psychologists, like Tolman, for being purely programmatic in their theorizing. There is some justification in this complaint. But the reason that other psychologists are less specific in their theoretical suggestions is perhaps because they are more aware of the difficulties. In fact, most of the *programmatic* psychologists suspect that the facts of learning cannot be described or explained in simple S-R terms. At present they are searching for new molar concepts which will take account of the relevant facts, and at the same time will have the inter-subjectivity of reference that was the chief merit of the original behaviorist conception of stimulus and response.

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PSYCHOLOGY AND THE WAR

Edited by
DONALD G. MARQUIS

CONTENTS

POST-WAR REEMPLOYMENT PROSPECTS IN PSYCHOLOGY, by *Donald G. Marquis* 653

PSYCHOLOGICAL WORK IN THE U. S. MARITIME SERVICE, by *Charles C. Limburg* 664

PSYCHOLOGY AND THE WAR: NOTES 669

ADVISORY BOARD ON CLINICAL PSYCHOLOGY
OWI PSYCHOLOGY NEWSLETTER

POST-WAR REEMPLOYMENT PROSPECTS IN PSYCHOLOGY

DONALD G. MARQUIS
Office of Psychological Personnel

During the period of occupational readjustment following the termination of World War II approximately one-half of the total number of psychologists will change their employment. Most psychologists have been too busy during the war years to give more than a passing thought to this problem—but that passing thought has often been tinged with apprehension about their personal prospects in the grand reshuffling. Some individuals, anticipating a great oversupply of trained psychologists, are looking for opportunities in new lines of work. Others are confident that the demonstrated utility of applied psychology in wartime service will create vast new opportunities with employment for all.

In order to provide an estimate of the magnitude of the reemployment problem and a basis for planning measures to deal with the problem, a survey of the post-war plans of all psychologists was undertaken in January 1944 by the Office of Psychological Personnel. Questionnaires were mailed to members of all psychological societies and to all who had registered with the National Roster of Scientific and Specialized Personnel or the Office of Psychological Personnel and who met the minimum requirements for associate membership in the American Psychological Association—a total of 4553 men and women. Returns were received from 84 per cent, with even better return from those in military service than from civilians. Some of the data obtained have been published in an article on the mobilization of psychologists for war service (3), which also contains a description of the technique of the survey.

At the time the survey was carried out there were 986 psychologists in the armed forces and 276 more employed as civilians by federal war agencies, including those working full-time under contract with the Office of Scientific Research and Development. Many others had shifted to new and temporary civilian positions to fill critical vacancies and to carry out the special assignments associated with the Army Specialized Training Program in the colleges and universities. Only one-half have remained in their regular positions.

Table I presents a summary of the post-war plans of psychologists as expressed in their replies to the survey questionnaire. The frequencies have been corrected from the total returns of 3824 to correspond to the total population of 4553. In addition to the number who will continue in their present position, return to a position from which they are on leave, or attend graduate schools, there are 1307 persons who indicate that they will be seeking new positions. The primary question is whether or not there will be 1307 positions available.

TABLE I

INDIVIDUAL POST-WAR PLANS OF PSYCHOLOGISTS

	Army	Navy	Civilian	*Total*
Continue in present position	17	5	2254	2276
Return to previous position	210	116	225	551
Attend graduate school	183	46	190	419
Seek a new position	265	144	898	1307
Total	675	311	3567	4553

ESTIMATION OF POST-WAR EMPLOYMENT

To estimate the number of available post-war jobs is difficult. The employment situation in psychology will naturally reflect the general economic condition of the country, but current predictions on this point do not have sufficient reliability to justify their consideration here. It is manifestly impossible to question each employer of psychologists on his post-war needs, and it is unlikely that he would be able to make a good estimate now. It is unfair to take the present level of civilian employment as a basis because so many vacancies are necessarily unfilled. It is equally unfair to base estimates on the employment levels in pre-war years, because of the steady progressive growth in the size of the profession, independent of strictly wartime increments. During the past fifteen years the number of employed psychologists has increased by approximately nine per cent each year, and this rate of growth has been maintained through the war years. The small decline in the number entering the profession from graduate schools is offset by those who have been recruited from bordering fields.

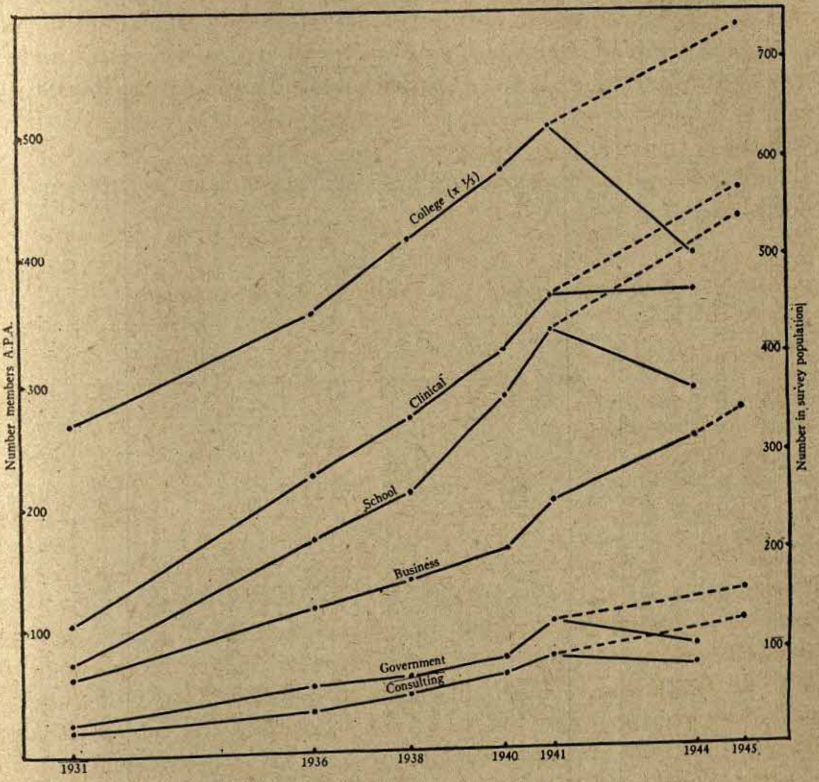

FIGURE 1. EMPLOYMENT TRENDS IN PSYCHOLOGY.

The frequencies for college employment have been divided by three in order to bring them within convenient range for this plot. Data for the years 1941 and 1944 are from the present survey; data for 1931 to 1940 are from Finch and Odoroff (1, 2), recategorized on the basis of original data supplied by Dr. Finch. The scale at the left is the one used by Finch and Odoroff whose count was based on APA membership. The scale at the right is for the larger population of the present survey which included 747 psychologists who are not APA members. The scales are adjusted in proportion (1.00 to 1.25) so that the trends will be continuous.

The best estimate of the post-war employment level should then be secured by an extrapolation of the regular growth in the several occupational categories. The survey provides employment data for January

TABLE II

ANALYSIS OF THE POST-WAR REEMPLOYMENT SITUATION IN PSYCHOLOGY

	Employment			Number jobs to be filled (3–2)	Return from leave	Net number to be filled (4–5)	Jobs to be vacated by shifts	Total jobs to be filled (6–7)	Job preference of those seeking new positions*	
	Jan. 1941	Jan. 1944	Post-war predicted						1st	2nd
Column	1	2	3	4	5	6	7	8	9	10
Universities and colleges	1875	1501	2180	679	368	311	336	647	721	375
Schools and educational systems	424	362	540	188	47	141	98	239	52	137
Clinical positions										
Guidance centers, clinics, agencies	215	202	263	61	21	40	66	106		
Prisons, correctional institutions	96	80	117	37	29	8	32	40	198	349
Hospitals, custodial institutions	146	183	190	7	28	−21	80	59		
Business										
Industry and business	178	245	260	15	25	−10	87	77	241	318
Public personnel agencies	73	68	85	17	16	1	35	35		
Government agencies	127	104	160	54	14	40	32	72	95	128
Self-employed (consulting)	96	85	120	35	3	32	8	40		
Federal war agencies	11	276								
Military service	11	986	40							
Advanced graduate students	274	197	580							
Non-employed or no information	272	264	268							
Total	3798	4553	4803	1093	551	542	774	1316	1307	1307

* The preferences have been regrouped to correspond to the employment categories. (See Table III for finer analysis.) The first figure includes preferences for college teaching and for college personnel and guidance; the third includes clinical and vocational guidance; the fourth includes industrial research and personnel work; the fifth includes all other preferences.

1944 and January 1941, and fortunately comparable data* for previous years are available in two published analyses by Finch and Odoroff (1, 2).

Figure 2 presents the overall picture obtained by combination of the two sets of data. The extrapolation to values for 1945 is by visual inspection and can be checked by any reader using the same means.

It is quite justifiably open to question whether or not the usual rate of growth of employment opportunities has been maintained in the war years. Growth of a profession such as psychology depends upon the summation of activities of individual psychologists in creating through their work an expanding need for more psychologists. There has been a necessary curtailment of such activities in civilian occupations during the war, and the shortage of trained personnel has made it necessary in

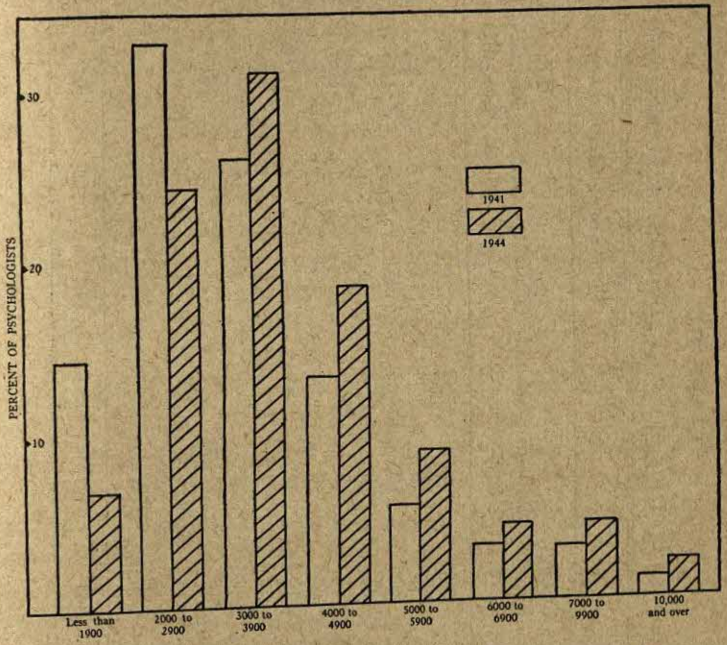

FIGURE 2. COMPARISON OF SALARIES OF PSYCHOLOGISTS IN 1941 AND 1944.

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* The categories of employment used in the analysis of the results in the present survey are not identical with those used by Finch and Odoroff in their published papers. Dr. Finch has very kindly furnished me with a much finer breakdown of his data into 23 categories, by the recombination of which it has been possible to secure comparable groupings.

TABLE III

PRESENT OCCUPATION AND DESIRED POSITION OF PSYCHOLOGISTS SEEKING NEW POST-WAR EMPLOYMENT

Present Occupation	Post-war Position Desired								
	College Teach. Res.	College Pers.	School	Clinical	Voc. Couns.	Ind. Res. & Consult.	Ind. Public Pers.	Other	*Total*
Student	58	8	4	29	3	1	3	7	113
Not employed	19	6	4	11	1	1	10	8	60
Military—commissioned	97	17	6	25	8	17	86	27	283
Military—non-commissioned	161	9	4	18	0	8	18	8	226
Federal war agencies	72	5	2	7	1	10	20	12	129
College or university	164	20	4	13	2	3	12	11	229
Schools and educational systems	17	2	19	12	2	1	4	4	61
Guidance centers, clinics, agencies	4	2	3	16	5	3	2	4	39
Prisons	3	2	1	3	1	3	5	2	20
Hospitals	14	2	4	23	0	0	2	7	25
Industry and business	19	2	1	7	4	2	16	5	56
Public personnel	5	1	0	1	3	3	7	0	20
Government agencies	8	4	0	2	1	1	3	0	19
Total	641	80	52	167	31	53	188	95	1307

many instances to forego plans for development of enlarged programs. It is not possible to estimate how great such deferred needs will be, or how completely they will become filled after the war. With respect to college teaching, however, which represents the greatest latent demand, there is good reason for optimism. The provision of federal funds for veterans' education, and the backlog of students drawn into military service, make it clear that there will be a great increase in college enrollments after the war. It is expected, furthermore, that college students will desire instruction in psychology to a greater degree than before because of their contact with psychological service and their awareness of psychological problems in their military experience.

If it is assumed that the extrapolations of the employment trends provide a reasonable basis for post-war prediction, the story is still incomplete. Some of the positions will be filled by individuals who were granted leaves of absence; other individuals who desire new employment will vacate positions which in turn must be filled. Table II presents an analysis of these additional considerations and permits a final estimate of the balance between the number of available positions and the total of 1307 individuals who plan to seek new positions.

Table II may be read in the following manner, taking the first row as an example. Column 1 indicates that 1875 psychologists were employed in 1941 by universities and colleges. Column 2 shows that there has been a decrease to 1501 in 1944. The values obtained by extrapolating the trends of Figure 1 are presented in Column 3, and the excess of Column 3 over Column 2 indicates a latent demand for 679. However, 368 intend to return to university employment (Column 5), which leaves only 311 positions available (Column 6). Column 7 shows the present employment of those civilians who are intending to seek new positions, to return to former positions, or to attend graduate school. There are 336 such positions in colleges which are now filled by temporary appointments and which will be vacated in the post-war shifting. When this number is added to Column 6 a total is obtained of 647 positions which need to be filled. Columns 9 and 10 present the preferences of the 1307 individuals who intend to seek new jobs. There is a fortunate agreement between the jobs available and jobs sought in the college field.

The principal conclusion from an examination of Table II is that there should be enough jobs for all who want them. The total of 1316 positions to be filled is balanced against the total of 1307 individuals seeking jobs. There is also reasonable agreement within the separate occupational categories, with two exceptions. It will be necessary to resort to second choices to fill the positions in school psychology, while the desire for jobs in business and industry far outruns the indicated demand.

POST-WAR SUPPLY OF PSYCHOLOGISTS

The data from the survey questionnaire provide a certain amount of information about the 1307 individuals who indicated that they would seek new positions after the war. Their present occupation is given in Table III with an analysis of their job preferences.

The group is predominantly young. Half of them completed their graduate training in 1939 or later; three-fourths, in 1936 or later. Women constitute 31 per cent of the group.

There is another source of potential psychologists which is not included in the present survey. The Army has given training and practical experience in personnel procedures to a large number of men assigned as classification specialists and personnel consultants. The amount of psychological training presented in the AGD schools for enlisted men and officer candidates is not great, but the practical experience in testing, interviewing and classification has in some instances at least aroused an interest in post-war employment in personnel work, vocational guidance or industrial counseling. The extent of this interest cannot be estimated, but it is likely that such persons will not become identified with psychology unless they elect to take graduate training.

The Army Specialized Training Program, however, provided intensive psychological training for about 1350 enlisted men. This training was carried out in 11 universities by the regular faculty of the psychology departments. The instruction was comparable in scope to two regular quarters of graduate work. The men are therefore in a position to compete for employment in psychology with regular students with the M.A. degree. It becomes a matter of interest to know the post-war plans of this group.

A special survey of the graduates of the ASTP course was carried out in 1943–44. Addresses were not available for all and returns were received from a total of 673. Only 30 of the entire group had enough previous graduate work in psychology to qualify for associate membership in the A.P.A., and they were included in the major survey of psychologists. The analysis of the pre-war occupation and the post-war plans of the total group is presented in Table IV. It is apparent that the ASTP training has influenced about half the group to change their post-war plans to some form of psychological occupation.

If it should develop that more than 600 new psychologists have been created by the ASTP, it will become a matter of interest to know their specific intentions. According to the survey returns, 230 intend to enroll in graduate school, 290 prefer jobs in industrial personnel work, 65 would like to work in vocational guidance, and 25 plan to enter college teaching. Other preferences are scattered among several occupational categories.

NEW EMPLOYMENT OPPORTUNITIES

It would be unreasonable to expect any sudden spurt in post-war employment in the college, school, or clinical fields. The expansion of these sources of employment is limited by the relatively stable number of employing agencies and by their financial capacity to hire additional psychologists. A more flexible situation exists in the fields of personnel work in business, industry and public agencies, and in vocational guidance.

TABLE IV

POST-WAR PLANS OF GRADUATES OF THE ASTP ADVANCED PERSONNEL PSYCHOLOGY COURSE

	Pre-War Occupation		Desired Post-War Occupation	
	Psychology	Other fields	Psychology	Other fields
Undergraduate student	1.1%	9.6%	6.7%	8.3%
Graduate student	.7	2.3	17.1	10.6
Employed	7.4	78.9	33.0	24.3
Total	9.2	90.8	56.8	43.2

Business and industry offer fields with almost unlimited possibilities for development. Psychologists now occupy only a minute fraction of the positions in personnel work and employee counseling. There is good reason to believe that if more trained psychologists were available, more positions would become available.

The Veterans Administration has need for 200–400 trained vocational counselors at salaries of $2600, $3200 and $3800. These men and women will work in association with newly established college centers for the examination and vocational counseling of disabled veterans. Because the present supply of qualified counselors is so limited, the agency is attempting to postpone filling as many of the positions as possible until the period of demobilization.

It is fortunate that the expansible fields in psychology are just the ones for which experience in military psychology is most valuable. Business and industry will want men with backgrounds in testing, classification and personnel work; the Veterans Administration and similar agencies will want men with military experience in testing and clinical psychology.

POST-WAR SALARY LEVELS

It is commonly recognized that wartime salaries for civilian professional workers are higher than pre-war levels. Although most college and university salaries are fairly stable, the critical shortage of trained psychologists has resulted in higher salaries in government agencies and in business and industry. Other employers in hospitals, clinics, schools and colleges have found it necessary to offer somewhat increased salaries in order to fill their vacancies.

Figure 2 presents a comparison of the distribution of salaries in 1941 and 1944. The median salary increased from $3100 to $3500 during his period. These figures represent all employed psychologists exclusive of students and those in military service. The data were obtained from the survey described above. The salary question was answered by 86 per cent of all who returned questionnaires.

Readjustment of salary schedules after the war is inevitable, but it is hoped that some of the gain of the past three years can be maintained.

GRADUATE SCHOOL ENROLMENT

A large increase in the number of graduate students in psychology can be expected after the war. Some estimate of the magnitude of the increase is essential for the most effective planning of programs by graduate departments. An inquiry was sent in May of this year to the chairmen of 77 departments which offer graduate instruction in psychology. Replies were received from 72, and reasonable estimates were made for the remaining five.

Graduate school enrolment has been reduced to approximately one half from 1941 to 1944. The inquiry shows that there were 1181 students in January 1941, a figure which agrees closely with the total of 1131 derived by the National Roster of Scientific and Specialized Personnel in a careful and complete count of all colleges for May 1942. In January 1944 our inquiry showed that there were 665 students or 56 per cent of the pre-war number. A similar estimate of the decrease in enrolment can be derived from the number of degrees granted. In 1941 there were 117 Ph.D. degrees; in 1944 there were 63.

It can be anticipated that the present level of graduate school enrolment will be maintained until the period of demobilization, since most departments are now reduced to their limit. There are several reasons for anticipating a marked increase in the number of graduate students after the war. Table I indicates that 229 persons whose education was interrupted by military service will return to graduate school, and that 190 more who have taken jobs during the war will likewise return. Table IV indicates that 230 graduates of the ASTP course in Advanced Personnel Psychology intend to enrol for graduate work. These figures alone indicate an enrolment of 1314, but additional considerations make it necessary to formulate an even higher estimate. There is an ever increasing backlog of college graduates and near graduates who will enter graduate school when their military service is terminated. This group was not reached in any of the surveys and is not included in the figures above. Some of such men may have had Army experience in personnel work, and if we can judge from the ASTP survey, the number who are interested in a career in psychology will be larger than usual. A final factor of major importance will be the financial aid extended by Public Law 346 (G.I. Bill of Rights) to veterans returning to school. This will also be of help to departments facing an increased number of student applications with limited funds for scholarships and assistantships.

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PSYCHOLOGICAL WORK IN THE UNITED STATES MARITIME SERVICE

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Lieutenant Commander, United States Maritime Service

The American Merchant Marine is now engaged in the greatest transportation job ever undertaken in the history of the world. This job is being done without fanfare by citizens of the United States in a civilian status.

The American Merchant Marine consists of:

Ships. At the outbreak of war in December, 1941, the United States had 1150 passenger liners, freighters, colliers and tankers, a total of 10,500,000 deadweight tons. In the period from January 1, 1942 to July 1, 1944 the number of ships built totaled 3,506 with a deadweight tonnage of 35,955,900.

Officers and Men. In peacetime approximately 50,000 officers and seamen were employed on our merchant ships. Since it requires a crew of approximately 45 to man the average vessel, it has been necessary to man the added vessels with experienced seamen returning to the industry or with inexperienced men newly trained for the work to be done.

Management. Several score steamship companies own or operate all the vessels in the American Merchant Marine, except for those now being used by the Army and Navy. All of the privately-owned vessels are now under the control of the War Shipping Administration which requisitioned them for emergency use. In most cases the vessels have been reallocated for management and operation to their original owners who act as agents for the government. New vessels built by the War Shipping Administration also are turned over to private companies for management and operation.

Government Agencies. Prior to the war, the U. S. Maritime Commission under the Chairmanship of Vice Admiral Emory S. Land, U.S.N. (Retired) was responsible for measures designed to improve the American Merchant Marine. The wartime functions of the U. S. Maritime Commission were transferred to the War Shipping Administration of which Admiral Land is Administrator, when this agency was established on July 11, 1942 upon Executive Order of the President.

In order to understand the relation of the government to the American Merchant Marine a brief historical note may be helpful. After several half-measures, the Congress of the United States took cognizance of the decrepit state of American shipping and passed the Merchant Marine Act of 1936. This Act defines the policy of the Congress with reference to the status of our Merchant Marine and contains a passage which has come to be known as the Magna Charta of the Merchant Marine which reads as follows:

> It is necessary for the national defense and development of its foreign and domestic commerce that the United States shall have a merchant marine (a) sufficient to carry its domestic water-borne commerce and a substantial portion of the water-borne export and import foreign commerce of the United States

and to provide shipping service on all routes essential for maintaining the flow of such domestic and foreign water-borne commerce at all times, (b) capable of serving as a naval and military auxiliary in time of war or national emergency; (c) owned and operated under the United States flag by citizens of the United States insofar as may be practicable, and (d) composed of the best-equipped, safest and most suitable types of vessels, constructed in the United States and manned with a trained and efficient citizen personnel. It is hereby declared to be the policy of the United States to foster the development and encourage the maintenance of such a merchant marine.

The Merchant Marine Act of 1936 established the United States Maritime Commission. The United States Maritime Service was established by the U. S. Maritime Commission in 1938 pursuant to authority of the Merchant Marine Act of 1936, as amended. During the period from March 1, 1942 to July 11, 1942, the United States Maritime Service was briefly administered through the United States Coast Guard. Training facilities were established to train merchant seamen, experienced or inexperienced to man the ships of the merchant fleet. Paralleling a U. S. Maritime Commission shipbuilding program aimed at replacing the veteran vessels of our decadent merchant marine, young Americans were recruited for service and placed aboard new ships after receiving approximately a year's training. As the clouds of World War II crowded the horizon and the necessity of a new large merchant marine became more and more evident, more training stations were opened and the length of the training offered was reduced in accordance with war-time conditions.

Presently under the cognizance of the War Shipping Administration, the United States Maritime Service is a voluntary, non-military organization intended to furnish training and other benefits for personnel of the United States Merchant Marine. Upon completion of training, enrollees are released to inactive duty for service aboard merchant ships. The Commandant of the U. S. Maritime Service is Rear Admiral A. B. Randall, U.S.N.R. (Retired). Administrative personnel and trainees are enrolled in the Maritime Service in the same ranks, grades and rates prescribed by law for the U. S. Coast Guard. Training stations and ships are maintained for apprentice seamen and for officers. Apprentice seaman training consists of a period of preliminary training in general and safety seamanship (boot training) required of inexperienced personnel followed by branch training in the deck, engine and stewards departments. Specialist schools are conducted for radio operators, cooks and bakers, pursers, pharmacist's mates, and the various specialist ratings in the deck and engine departments. Officers schools conduct separate courses for deck and engine officer candidates with special courses of instruction being provided in such fields as diesel engineering, turbo-electric drive, etc. In addition, various upgrading facilities are provided.

Responsible officers in the U. S. Maritime Service were quick to recognize the potential contribution to the training program which could be made by administrative personnel with a background of psychological training. Accordingly, soon after the Maritime Service was transferred from the United States Maritime Commission to the Training Organization of the War Shipping Administration, an officer was attached to Headquarters for the purpose of developing the program. The keynote of this program emphasized intelligent action by officers thoroughly experienced in psychological procedures and techniques relating to indoctrination, classification, teaching and training, selection for specialized training, and problems of personal adjustment. The operation of this program is briefly summarized in a job analysis schedule for Classification and Selection Officers attached to all training stations.

UNITED STATES MARITIME SERVICE

Job Analysis Schedule

1. *Job Title:* Classification and Selection Officer.
2. *Alternate Titles:* Station Psychologist; Educational Officer.
3. *Department:* Training.
4. *Job Summary:* Directs the administration of classification and selection procedures in training station: (1) screens out and recommends disenrollment of mentally inept enrollees who are unsuitable for training; (2) orients trainees with respect to opportunities for training and placement; (3) supervises the administration of aptitude tests; (4) collects supplementary classification and selection data; (5) interviews enrollees for purpose of classification, selection, and guidance; (6) selects qualified enrollees for branch training, special schools and administrative duty; (7) acts as adjustment counselor; (8) develops and supervises the administration of objective achievement tests during training; (9) assists in instructor training; (10) prepares statistical and narrative reports of activities; (11) introduces new classification and selection procedures as prescribed by Headquarters; (12) lectures on educational and personal adjustment subjects; (13) attends staff conferences; (14) prepares pertinent correspondence; (15) may stand collateral duty as Educational Officer in indoctrination and examination for promotion of administrative personnel; (16) may stand collateral station and departmental watches and inspections; (17) may march in reviews.
5. *Supervision Received:* Administrative from Station Training Officer; technical and professional from Headquarters Classification and Selection Officer.
6. *Supervision Given:* Classification and Selection personnel.
7. *Educational Requirements:* Ph.D. or equivalent in psychology or related fields.
8. *License and Certificate Requirements:* None.
9. *Experience Requirements:* Broad practical experience in fields of clinical and educational psychology, training methods, psychometric methods, personnel work, statistics and administration.
10. *Promotion Requirements:* (1) Professional and technical proficiency; (2) Maritime Service Instructions (Regulations); (3) Minimum service requirement in grade; (4) Satisfactory efficiency reports.

11. *Job Knowledge:* (1) General and specific information relating to all aspects of duties outlined under job summary; (2) relation of Maritime Service training courses to merchant marine ratings; (3) requirements for enrollment, transfer, upgrading and release to inactive duty; (4) pay and supply instructions; (5) intimate familiarity with Headquarters and station directives governing policy and operations.

12. *Responsibility:* (1) For promotion, development and efficient operation of Classification and Selection program in his unit according to professional standards; (2) for most effective use of available manpower; (3) for keeping abreast of events and techniques relating to his field in other services; (4) for intelligent use of materials at hand; (5) for security of all confidential and restricted information and materials relating to his department; (6) for collaboration with all department and section heads as may be required.

13. *Physical Requirements:* (1) Maritime Service administrative duty standards; (2) physical fitness, since duties require him to be alert, aggressive and personable.

14. *Equipment:* Office equipment; classification and selection forms, orientation materials, aptitude and achievement tests; test scoring and calculating machines; manuals.

15. *Comments:* This schedule outlined herein may vary from station to station depending upon the size and function of the station.

In addition to work done by psychologists acting as Classification and Selection officers, the U. S. Maritime Service utilizes the services of men with psychological training and experience in a special developmental unit. Inasmuch as the Maritime Service is almost exclusively concerned with the recruitment, classification and training of men for service aboard merchant vessels, it has been considered advantageous to establish a Personnel Procedures Unit. The function of this Unit is believed to be somewhat similar to both the Personnel Research Section of the Adjutant General's Office of the Army and to the Standards and Curriculum Section of the Navy. The present functions of the Personnel Procedures Unit in the Maritime Service may be outlined briefly as follows:

1. To conduct organizational surveys of Maritime Service Units as required and to analyze all ranks and grades in the Maritime Service for the purpose of preparing job specifications for use in recruitment, selection, training, upgrading, and related functions.
2. To develop personnel forms used in the recruitment, assignment to duty, and transfer of administrative personnel and to maintain a central file of personnel classifications within restricted areas.
3. To coordinate and assist in the administration of educational programs designed exclusively for administrative personnel and to collect, revise and distribute indoctrination materials for use in all Maritime Service Units.
4. To prepare standard promotion examination procedures for use with all Maritime Service enlisted personnel assigned to administrative duty.
5. To develop new classification and selection techniques and procedures for use with all trainees who are processed by Classification and Selection Officers.

The work of the U. S. Maritime Service and of the U. S. Maritime Commission will continue after the war. In this respect, Admiral Land has summed up the policy as follows:

> There can be no question about our post-war objectives. They are clearly defined not only by the Merchant Marine Act of 1936, but by the now rapidly reshaping world situation. Our goal is to have the best ships in the world and as many of them as any other nation. We must plan, too, so that those ships shall carry a sufficient portion of world trade to restore the United States to a Maritime position befitting a nation of her status. Never again must we allow our merchant marine to become the Nation's cross-eyed stepchild.

PSYCHOLOGY AND THE WAR: NOTES

Advisory Board on Clinical Psychology. In connection with the recent establishment of a clinical psychological program in the hospitals of the Army, Lieutenant Colonel MORTON A. SEIDENFELD has been designated as Chief Clinical Psychologist and Captain JON EISENSON as Assistant Chief in the Classification and Replacement Branch of the Adjutant General's Office.

To advise The Adjutant General on matters of policy and procedure in connection with this program, an Advisory Board on Clinical Psychology has been appointed by the National Research Council, with DR. WALTER V. BINGHAM serving as Chairman. Psychiatrists and psychologists on this Board include ARTHUR H. RUGGLES, M.D., Butler Hospital, Providence, Rhode Island; FRANK FREMONT-SMITH, M.D., Josiah Macy, Jr., Foundation; LAWRENCE S. KUBIE, M.D., College of Physicians and Surgeons, Columbia University; DR. MILES MURPHY, University of Pennsylvania; DR. FREDERICK LYMAN WELLS, Harvard University; DR. ROBERT R. SEARS, University of Iowa; and DR. DAVID RAPAPORT, Chief Psychologist, Menninger Clinic, Topeka, Kansas.

OWI Psychology Newsletter. The disruption in the normal system of international communications has cut many scientists off from news of the outside world. To combat this, The Overseas Branch of the Office of War Information has instituted monthly newsletters in a number of fields such as Psychology, Physics, Medicine, etc. These newsletters are reproduced by a photo-offset process on thin paper, and are distributed to OWI offices and U. S. Foreign Service posts throughout the world. The overseas staffs then make the material available in translation to interested people. The South American countries are covered by a special arrangement with the Office of the Coordinator for Inter-American Affairs.

The Psychology Newsletter is released under the authority of the American Psychological Association. It is prepared at Brown University, with the aid of galley proofs of the *Psychological Abstracts.* Dr. Ansbacher prepared the first 12 numbers, and Dr. Schlosberg has carried it on during the last year. A typical letter consists of digests of 10 important American contributions to the field of psychology, and is 400 abstract lines in length. An effort is made to distribute these digests evenly over the various sub-fields.

The letter is written for psychologists, psychiatrists, and educators. There is no way of knowing how many people actually see the Psychology Newsletter, but there are clear indications that it is widely read. The OWI considers the newsletters to be among its most successful ventures.

The newsletters are not generally available in this country, because of legal restrictions on domestic distribution of material sponsored by the OWI's Overseas Branch. Copies are on file in the office of the Secretary and of the *Psychological Abstracts.* Carbons of the manuscripts are now sent (informally, by the writer) to Miss Van de Water of Science Service for her use, and several of the digests have been rewritten for release through Science Service.—HAROLD SCHLOSBERG (*Brown University*).

MORGAN, C. T. *Physiological psychology.* New York: McGraw-Hill, 1943. Pp. xii+623.

Psychophysiology has recently become the scene of intensified activity. The number of workers engaged in the study of psychophysiological problems has greatly increased. New techniques have been developed and applied to psychophysiological problems, and a large body of new data has accumulated. Acquired largely through the study of individual problems, these data need to be coordinated and to be integrated with the body of already existing facts in this general field. Dr. Morgan's new *Physiological Psychology* constitutes a preliminary attempt to meet this need.

The materials are organized with respect to twenty-six, essentially psychological, chapter-headings. The author's plan of treatment seems to be two-fold: (1) to summarize the various experimental data which fall under each general heading, and (2) to evaluate views that have been expressed regarding mechanisms that are conceived to be involved when the given phenomena are eventuated. The definition submitted for physiological psychology—the study of the physiological mechanisms of behavior—seems to emphasize the second aspect of this plan, but the text makes clear that physiological mechanisms are of interest as a means to the elucidation of the relevant phenomena.

The scope of psychophysiology is here broadly conceived. The first five chapters are devoted to historical introduction, cellular functions, internal environment, nerve cell functions, and nervous system. Chapters 6 and 7 are concerned respectively with phylogenetic and ontogenetic development. Chapters 8–14 deal with the various senses; chapters 15–22, with diverse motor phenomena; and chapters 23–26, with motor and discriminative learning, memory, and symbolic processes. Even if unsettled problems are neglected, this classification embraces most of the problems in which activity has been accelerated in recent years.

The treatment in the chapters concerning the several senses is notably different. Although the problem of quality is specifically considered in all of these chapters, and in some cases specific versus non-specific views are contrasted, quantitative laws are presented only for vision and hearing. Quantitative relations which have been determined in the other senses, e.g. regarding sensitivity, adaptation, intensity discrimination, acuity, are not specifically treated. The several varieties of visual acuity are not differentiated, and an extensive literature on tactual acuity, containing significant physiological meaning, is not included.

Students will search this book in vain for a general discussion of one of the earliest of psychophysiological problems to be subjected to thoroughgoing investigation, i.e. space perception. This topic now embraces an extensive literature in which many of the involved physiological mechanisms, e.g. accommodation, light reflex, image formation, are fairly well understood, while others, e.g. size constancy, visual acuity, binocular fusion, are the basis of much theoretical conjecture. In view of these facts, and the author's expressed intent, it is not easy to defend the author's omission of this problem.

In the opening sentence of the preface, the author expresses his intention to prepare a work that will suit the needs of widely different classes of students—undergraduate and graduate students, and workers in the special fields of psychology, physiology, and medicine. Truly, it would be a triumphant achievement if the extensive literature on general psychophysiology were to be successfully condensed for these diverse groups in a volume whose text and 176 illustrations cover only 567 pages. Although the appended bibliography contains 980 references, it nevertheless fails to include many important studies in physiological psychology which are indispensable to the needs of the graduate student, let alone the more advanced specialist. The present work would serve the needs of undergraduates better if the treatment were less encumbered with conflicting theoretical discussions.

A chief end-in-view in the successive chapters avowedly is the delineation of the physiological mechanisms which are involved when given sensory and motor phenomena are elicited. The characterizations in most cases, however, are not very detailed. Incidentally, Dr. Morgan is in error when he gives chief credit to Crozier for the principle of neural availability; the idea is Holway's, not Crozier's. The principle (neural availability) has been studied and developed by both of these investigators, and by others, but most of the work was inspired or directed by the originator. In the chapters on learning, memory, and symbolic processes, the physiological interpretations are largely theoretical, comprising essentially the presentation of such views as have been advocated by authorities to account for a restricted body of psychological and/or psychophysical data. In other chapters, where data which have been obtained through the use of the newer physiological techniques are utilized as a supplement to existing psychological and psychophysical information, the physiological interpretations are carried somewhat farther. These differences are perhaps inevitable, owing to differences in progress in the various reaches of this branch of science.

Dr. Morgan's interpretations concerning physiological mechanisms are sometimes suggestive and the reviewer wishes that a more thoroughgoing effort in this respect had been made. There is ample reason to justify the expectation that the mechanisms for many phenomena might have been given in greater detail. The author's bibliography includes many references to studies in which the neural events associated with the eventuation of diverse aspects of behavior are already available in some detail. If these data had been brought to light in connection with the development of his conception of the internal environment, a more unitary development of the way that external conditions (the stimulus) influence behavior through differential action in the internal environment might have been achieved.

Much additional information will, of course, be needed before the nature of mechanisms involved in the elicitation of diverse forms of sensory and motor phenomena can be given in detail. However, newer methods which have recently been used to disclose the nature of certain biochemical reactions that are associated with sensory and motor items are promising. Using the well-known conception of the internal environment, Dr. Morgan has prepared the general ground for the study of these reactions. What is needed now is a detailed analysis of the diverse modes of chemical and physical interchange which take place in the organism via intercommunications among nervous, muscular, circulatory, digestive, and respiratory systems. This constitutes one of the most inviting and interesting tasks in present-day science.

MICHAEL J. ZIGLER

Wellesley College

DAVIDSON, HELEN H. *Personality and economic background: a study of highly intelligent children.* New York: King's Crown Press, 1943. Pp. 189.

In this monograph two purposes are clearly set forth: to describe the personality of gifted children who differ in socio-economic background, and to discover the extent to which personality differences are related to background differences. Since much of the content is technical, and the approach scholarly rather than popular, the book is apparently intended for teachers and students in the fields of psychology, sociology, economics, and education.

After careful consideration of available indices, income was selected as the measure of socio-economic status. Personality traits were measured by means of the Rorschach Test, the P.E.A. Scale of Beliefs, the Minnesota Scale for Survey of Opinions, the P.E.A. Interest Index, and Hildreth's Personality and Interest Inventory. Other data were collected by means of a miscellaneous questionnaire, school achievement records, the new Stanford Achievement Tests, and the Stanford-Binet Intelligence Test. The selection of tests followed after a survey of available instruments, and a competent digest of relevant literature.

The subjects in the investigation were 102 children nine to fourteen years of age, 49 in the Speyer School and 53 in the Lincoln School in New York City. All the children had IQ's over 120. The income groups represented ranged from under $1500 to over $10,000 per year. Mrs. Davidson found this group as variable in measured personality as any ordinary group, in spite of the relative homogeneity in IQ. However, very little relationship was found between socio-economic background and personality type or traits.

Some of the interesting findings were in the nature of exceptions to the above-mentioned general conclusion. Income was significantly related to general responsiveness to stimuli, ability to think as ordinary people do, liberalism in social issues, preferences for games and sports, choice of newspapers and magazines, extent and nature of dreams, fears, wishes and worries, and experiences in taking paid lessons in art and music, as well as type of summer vacation experience.

These bright children tended to be well adjusted, but more often in an introverted than in an extraverted way. The poorer ones were more often maladjusted. Girls were more often extraverted. Those in the middle income groups seemed best adjusted. Liberalism was markedly correlated with mental age. There was a marked negative correlation, even in this group, between income and economic liberalism. In general, the children were characterized by good morale, good personal adjustment, and harmonious family relationships. According to the inventory, they showed only a moderate interest in school subjects, and relatively little interest in science, foreign languages, and mathematics. The school achievement of the group was far beyond their chronological age norms.

The lack of relationship of personality traits to income is adequately discussed, and the possible significance of the age of the children pointed out. The group of bright children is well worthy of study, but perhaps a 9–14 year old group is least likely to be deeply affected by economic circumstances. The children were well aware of existing social problems, but had nothing to offer in the way of solutions; this is not surprising, of course, as one does not expect even bright children to reconstruct a culture, or to go far beyond their elders, their teachers, and their social and political leaders.

The worries of the poorer children indicated a need for instruction as to economical means of securing higher education. As further implications for education, the author suggests: that school experiences should be broadened to offer to all the opportunity to experience games and sports of all kinds; that the better magazines and newspapers should be provided for all; that much talent now wasted might be developed through instruction in various arts; that summer vacations might be arranged for all; that these aims might be realized either through use of existing agencies or through setting up of agencies in the schools.

The material is competently handled throughout. Even the reprehensible accomplishment quotient is used without error and forced to yield some dividends.

One may say, in final summary, that we have here a unified and forceful study, competently done, presenting new material concerning bright children, and contributing interesting specific insights into a number of problems recognized as important in psychology today.

HAROLD D. CARTER

University of California

MCMURRY, R. N. *Handling personality adjustment in industry.* New York: Harpers, 1944. Pp. xi +297.

This volume is a timely one for it comes at a moment when industry is forced to recruit the marginal worker and is faced with the problem of hiring or re-employing the returning veteran who may be temporarily unstable or neurotic.

The treatment, directed toward management, consists of four parts: (1) labor problems, (2) the problem employee, (3) selection problems, and (4) training problems, and may be briefly summarized as follows: Job dissatisfaction occurs because of personality friction between employees and supervisors or executives, weak or inconsistent company policy reflected in first line supervisors, the totalitarian structure of industrial organization with consequent aggressive outlet upon the employee, and lack of opportunity for the expression of grievances.

The function of the labor union is to provide "a source of security, a punitive instrument, and a device to promote self-interest and a means of freeing the worker from guilt and responsibility." Good will and morale can be built by the "cathartic" method, the use of sports to relieve hostile tensions, by stimulating plant competition, and by displacing hostilities upon a common enemy—for example, the Japs. Employee participation in departmental administration is also advocated.

The number of problem employees—that is, vocationally or emotionally maladjusted—are estimated as nearly one-third of all gainfully employed. Five patterns of personality maladjustment are encountered in industry: "(1) *excessive preoccupation with the self* (extreme introvert traits); (2) *attacks* on the things and persons of the environment; (3) aggressions which are *turned inward upon the self* (self-punishments, purposive accidents, alcoholism, and self-induced failure); (4) *passive, dependent traits* (inability to find or hold a job); and (5) *compensations* for insecurities and inadequacies."

Job success depends upon (1) intelligence, skills, aptitudes, and (2) personality makeup and motivation. The latter is often of greater importance than the former. Three basic types of selection techniques are advocated: (1) the weighted application blank, (2) psychological tests, (3) the standardized or planned interview. The interview is the best means of measuring personality adjustment and motivation. Satisfactory and unsatisfactory employees in the plant should be studied to determine the traits that make for success and these findings applied in interpreting the results of the standardized interview. The home should be visited and studied for home adjustment has a bearing on work adjustment. The total findings can then be used in rejecting the undesirable applicants and in selectively placing within the plant those accepted. Where the labor market does not permit rejection of applicants, the interview findings permit specific cautions to be taken in regard to potential weaknesses of the applicants hired.

Training helps the employee in adjusting to his job as well as in improving his skills. Before training can be effective, the employee must be convinced that it will help him personally. The subject matter must be attuned to the level of those to be taught and the material must not be presented too rapidly. Trainees should understand the reasons for rules or operations taught them and the final test of achievement is whether they can communicate matter learned to others. The conference method should be used.

In considering this work, it is evident that the author's intention was to apply the principles and techniques of clinical psychology and psychiatry to the adjustment of the problem employee in industry. This attempt has been only partially successful for general and specific reasons. There is no consistent and organized psychological approach to personality problems although psychoanalytic concepts are most frequently borrowed. All maladjustments in industry are ordered to a half-dozen or so clinical concepts—hostility, immaturity aggression, insecurity, inadequacy, guilt—and these are used comprehensively and indiscriminately without regard to individual differences. While the formulations apply to some maladjusted workers, they in turn do not apply to others. There is a tendency toward generalization which is unwarranted even within the non-experimental structure of clinical methodology. For example: "In most disputes, neither the employees nor their representatives are greatly concerned with the justice of their demands. Their aims are primarily punitive. They hate the company and seek only to make it suffer and pay" (31). Again, " . . . many of the misfortunes which beset the problem employee, both on and off the job, are expressions of self-punishing and self-destructive tendencies within himself" (76). Schizophrenia is defined as the final stage or extreme of introversion and the implication is given that such conditions are common in industry (77). It is a well known fact and reiterated by K. E. Markuson and A. L. Brooks that psychoses are relatively uncommon in industry.

With the exception of a list of reading references, documentation of the general clinical psychological and psychiatric literature is largely absent. Missing also are references to the existing industrial hygiene and psychiatric literature.

In the discussion of selection techniques, personality or temperament tests are curtly dismissed—despite the growing literature—on the grounds that the employees are not always truthful in answering the questions.

The techniques to be employed in correcting personality maladjustments in industry are superficial. While the author agrees that attitudes and habits have to be altered, with the exception of outlining in-service training courses for the improvement of skills, little information is given as to the manner of achieving this. Catharsis in a variety of forms is used as the sine qua non of therapy and little provision is made for a planned employee counseling program or of referral to community agencies or other community resources.

Thirty-three pages of the book—a part of the chapter on the training of interviewers—consists of a miniature psychiatric manual designed to train personnel interviewers in the theory of personality. In presenting this outline, it is the author's contention that psychologists or psychiatrists are not required to administer the counseling program and that personnel men can be satisfactorily trained to handle the maladjusted workers. While the latter point can certainly be disputed, it is not a matter of conjecture that an abridged psychiatric text is not within the scope of a work of this nature particularly when personnel men can be referred to any number of excellent texts in the field.

The author should be commended for his attempt to fill a well defined need in industry but it cannot be said that the need has been adequately filled.

ARTHUR BURTON

California State Personnel Board

SARGENT, H. STANFELD. *The basic teachings of the great psychologists.* New York: Garden City Publishing Co., 1944. Pp. xiv+346.

The title of this book might suggest something other than it is—a book written for the lay reader or possibly the former student who may want some book of a "refresher" nature. The book is designed to give an introduction to the whole sweep of psychological science. It purposes to accomplish this end by setting down in brief summarizing statements and paragraphs the major experimental findings, theories, and hypotheses that have accumulated throughout psychology's history. A sample of the topics included in the book's 20 chapters gives an indication of its scope: The schools of psychology, psychological measurement, heredity and environment in development, motivation, personality, abnormal psychology, social psychology, learning, perceiving, thinking, and psychology in everyday living. The lay reader will find the book interestingly written, he will view a panorama of psychological theories, a stage peopled by a galaxy of psychologists, philosophers, sociologists, medical men, social workers, and criminologists. He will find in the last pages brief biographical notes on 262 of the men presented in which their chief work or contribution is cited. The print is clear and easily read. The book is inexpensively bound and sells for a nominal price.

The psychologist, not being a lay reader in the field, can hardly evaluate the book as the layman might. The present reviewer can report the comments of two laymen with whom he discussed the book. The first refused to read it because he "would want something more than short, snappy statements that probably conceal as much as they reveal of the type of thinking, the pros and cons lying back of the statements." The second, after reading the chapter on heredity and environment, was impressed with the fact that the stated conclusions did not seem to be backed by adequate experimental proof.

The psychologist will find the following faults with the book. The term "basic teachings" is really a misnomer in the sense that it should refer to the pervasive and fundamental principles which form the main structural features of a systematic presentation. In the book the "basic teachings" boil down too often to single sentence formulations of experimental findings. Again, the expression "great psychologists" is misleading. There simply are not 262 "great" psychologists in the history of psychology in the usually accepted sense of the word. The book indiscriminately mixes sociologists, philosophers, social workers, anatomists, and at least one (da Vinci) who is better known as an artist, with psychologists. The reader cannot determine from the text which are the "great" and which are the "near-great." The psychologist will miss the surge of controversy, the ebb and flow of psychological opinion that constitute the fabric of psychology as he knows it to be. He will not, therefore, be interested in reading the book and probably will question whether the lay reader will profit much from its study.

R. H. Waters

University of Arkansas

Various. *The march of medicine.* New York Academy of Medicine Lectures to the Laity, 1942, No. VII, 1943, No. VIII. New York: Columbia Univ. Press, 1943. Pp. x+217; Pp. ix+151.

"The scope of the *Lectures to the Laity* on the art and romance of medicine has been greatly enlarged since their inception nine years ago. This broadened base now includes lectures on Nature and human behavior, both normal and abnormal, in the individual and in the mass, morals, philosophy, and world crises" (No. VIII, vi). This announcement should make the psychologist feel very much at home, and indeed he is not disappointed. Glancing over the table of contents he finds few subjects of purely medical interest. He is reassured by titles dealing with child development, genius, psychoanalysis and crime. Although the topics are purposely diversified they are united in the purpose of interpreting the findings of medicine to the layman for the betterment of his world. Various social schemes are proposed in the name of science. For example, in *Nature and Man*, R. R. Williams suggests a return to the rugged individualism of the frontier to allow the operation of the law of natural selection in human society. Labor unions, corporations, and "government guarantees of freedom from want" would all be liquidated and the individual forced to struggle for existence. Dr. Williams seems to overlook the fact that unless the frontier itself could be brought back, the inequalities inherent in a fully expanded industrialism would make for the most "unnatural" selection.

A different kind of society is envisaged by McGraw in *Let Babies Be Our Teachers.* In the babies whose development she has watched for many years one of her principal observations was a shift toward increased purposiveness in behavior as control shifted from subcortical centers to the cortex. She believes that "there are fundamental properties of growth, and that the same principles are at work whether it is the growth of a salamander embryo, the behavior of an infant, or a social system" (VIII, 116). She attempts to bridge the gap between individual and society by introducing the concept of "social cortex." When the social cortex takes control, new social systems will arise which will be purposive, recognizing the sovereignty of the global whole while at the same time granting "individuation" to the parts. Since this attractive theory is based on analogy alone, it can be only a hope rather than a necessary emergent.

In Gesell's *Genius, Giftedness and Growth*, we have a further emphasis on biological continuity. His thesis is that genius is a growth process not differing in kind from other growth processes. "Thought structures are just as real, just as somatic as crystals and fiber structures" (VII, 137). By the use of illustrations from the lives of such recognized geniuses as Coleridge and Darwin, he shows how their creative efforts depended on their whole previous development. He points out that while the mechanisms of genius are biological, it is up to society to make the best use of it. Just how society could get its geniuses under control and yet give them the necessary freedom in which to grow is left to the reader's ingenuity.

The "tough-minded" psychologist, taking it for granted that behavior must have a structural basis, is hardly prepared for dualism in the renowned Tracy Putnam. The evidence against specific cortical localizations of the intellectual functions leads him to postulate a kind of Heisenberg principle in consciousness. "The most telling positive argument against the *conscious automaton* theory is the sense of purpose and significance which is almost universal in the human race" (VII, 62).

After this excursion into mysticism it is a relief to get down to earth and grapple with immediate social problems. In *Crime and Punishment*, the famous criminologist, Bernard Glueck, shows that the criminal problem reflects the confusion, insecurity and aggression of contemporary civilization and he anticipates increased difficulties during the postwar readjustment. He pleads for the replacement of the punitive by a psychiatric attitude in the interests of rehabilitating the criminal.

Some of the deepest insights into problems of social adjustment have come from the psychoanalysts. Brill gives a clear and sympathetic account of the development of Freud's system in *The Freudian Epoch*. From Hippocrates' diagnostic use of the dream to Freud's *Traumdeutung*, the chief milestones are reviewed. The discussion ends with a psychoanalytic interpretation of Freud himself in terms of his identification with Moses, the great liberator who had to face the prejudice and opposition of those whom he tried to free. Without belittling this excellent paper we may point out the need for a more objective, critical evaluation of the psychoanalytic movement for the layman.

According to Freud, war serves to drain off the accumulated hostilities of individuals and consequently is necessary for the preservation of internal peace. In *Aggressiveness—Individual and Collective*, another psychoanalyst, Franz Alexander, would limit the Freudian thesis to autocracies where the individual suffers severe frustrations. In the democracies where independence and self-expression are encouraged, war cannot be rationalized in terms of human needs. He sees the prospect of permanent peace through the development of an international conscience under the guidance of an international federation.

The value of these lectures as a contribution to public enlightenment can hardly be overestimated. The only danger lies in the possible confusion of the layman by the doctors' disagreements as to how to cure our sick society. This danger can be avoided only if each contributor carefully distinguishes between fact and interpretation so as not to influence unduly lay opinion through medical prestige on questions that go beyond medical authority.

Looking ahead to future numbers in the series, one wonders if in the interests of building a better world, the New York Academy of Medicine might not give the benefit of the *March of Medicine* to the public in the fields of maternal health and sex education. And finally, could we as laymen, dare to suggest discussion of our greatest hope—socialized medicine?

GEORGENE H. SEWARD

Connecticut College

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WECHSLER, D. *The measurement of adult intelligence* (3rd Ed.). Baltimore: Williams and Wilkins, 1944. Pp. vii+258.

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NOTES AND NEWS

Eugene Lerner, professor of psychology, Sarah Lawrence College (Bronxville, N. Y.), died, Sept. 21, at the age of forty-three years. Dr. Lerner, who was born in Budapest, became an American citizen in 1927. He had done clinical work in child-guidance institutions in Brooklyn (N. Y.) and Newark (N. J.) before going to the department of psychology, Sarah Lawrence College, in 1936.

Raymond Royce Willoughby died on Oct. 3, at the age of forty-eight years. He is best known to psychologists as Associate Editor of the *Psychological Abstracts* (1926–40), and for his publications in the fields of social psychology, personality, and individual differences. Since 1940 he has been Chief of the Division of Research and Statistics in the (R.I.) State Department of Social Welfare.

Forrest H. Kirkpatrick, dean of students, Bethany (W. Va.) College, who has been on leave serving as personnel administrator with the RCA Mfg. Co., has been appointed by Secretary Cordell Hull as consultant on personnel administration for the Department of State.

Frederick Wyatt has been appointed psychologist at McLean Hospital, Waverley, Mass., while continuing as assistant psychologist at the Department of Neuropsychiatry of the Massachusetts General Hospital, and as special instructor in psychology at Simmons College.

Sara Stinchfield-Hawk of the department of psychology, University of Southern California, has been appointed as visiting associate professor of psychology at Scripps College (Claremont, California).

Anna Spiesman Starr, professor of psychology in University College of Rutgers University (New Brunswick, N. J.), has been appointed director of the psychological and mental hygiene clinic at that institution.

John G. Peatman, associate professor of psychology, City College, New York City, has been appointed associate dean.

Franklin J. Shaw, formerly instructor in psychology at Bates College (Lewiston, Me.) has been appointed assistant professor of psychology at the University of New Hampshire.

New appointments to the staff of Centenary Junior College (Hackettstown, N. J.), include the appointment of Robert B. Garber to the department of psychology.

Leslie K. Patton, professor of psychology and director of personnel, Coe College (Cedar Rapids, Iowa), has accepted a post with the USO.

Franklin C. Paschal, dean, Junior College, and professor of psychology, Vanderbilt University, resigned on September 30.

DePauw University has announced the appointment of Joseph C. Heston as director of the newly-created Bureau of Testing and Research. The Bureau is designed to afford a centralized university service for both routine group and individual tests in the areas of educational achievement, vocational guidance, and personality adjustment. Plans for more personalized student counseling include faculty in-service training under the sponsorship of the Bureau. Dr. Heston will continue to teach clinical and applied courses in the psychology department.

At the invitation of the Department of State, six Chinese institutions have sent representatives to the United States for a year in order that contacts may be made between these distinguished scholars and American scholars and institutions. Among the visitors are DR. CHEN-SHENG YANG, formerly Acting Dean of the College of Arts and Literature at the National University of Peking, who studied education and psychology in this country from 1919–1923, and DR. GING-HSI WANG, Director of the Institute of Psychology of the Academia Sincia. Departments of psychology will be interested to know that invitations to the professors to lecture or take part in conferences may be issued through the China Section, Division of Cultural Cooperation, Department of State, Washington 25, D. C.

GING-HSI WANG, neuro-physiologist and head of the Institute of Psychology of the Academia Sinica, Kweilin, China, is spending a year in the United States at the invitation of the Department of State in connection with the Department's program of cultural relations with China. Dr. Wang received his Ph.D. degree from Johns Hopkins in 1923 and was an assistant and instructor in psychobiology in Johns Hopkins Medical School in the periods 1923–24 and 1925–27, respectively. He has been professor of psychology at: Chunchow University, 1924–25; National Sun Yat Sen University, 1927–31; and the National Peking University, 1931–34. Since 1934 he has been Director of the Institute of Psychology, Academia Sinica.

The 35th Annual Meeting of the National Committee for Mental Hygiene will be held on Wednesday and Thursday, Nov. 8 and 9, at the Hotel Pennsylvania in New York. Topics of the various sessions will include "Mental Hygiene of Industry and Reconversion"; "Rehabilitation and the Returning Veteran"; "Race Relations"; and "Services to the Mentally Ill Today." A luncheon session on Thursday, Nov. 9, will be devoted to the topic "Mental Hygiene Considerations in Peace Plans."

The Personnel Bureau of the University of Illinois has opened wide its doors to help any Illinois veteran in decisions about his vocation or education, and his personal or psychological problems.

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Psychological Bulletin

SYMPOSIUM*

PSYCHOLOGY AND POST-WAR PROBLEMS

CALVIN P. STONE, *Chairman*

Educational Acceleration and Post-War Scientific Leadership: SIDNEY L. PRESSEY, 681
Psychological Adjustments of Discharged Service Personnel: CARL R. ROGERS, 689
Occupational and Vocational Counseling of Military and Civilian Personnel During the Period of Post-war Demobilization and the Years Immediately Therafter: CARROLL L. SHARTLE, 697
Expanding Opportunities for Women Psychologists in the Post-war Period of Civil and Military Reorganization: FLORENCE L. GOODENOUGH, 706
Psychology—Some Unfinished Business: H. H. REMMERS, 713

EDUCATIONAL ACCELERATION AND POST-WAR SCIENTIFIC LEADERSHIP

SIDNEY L. PRESSEY
Ohio State University

Need for Acceleration and Change in Graduate Programs. In the school year 1941–2 institutions of higher learning in this country granted 21,075 masters and 3,676 doctorates—indeed a notable total of people with advanced training, and twelve times as many as received such degrees in 1900. But in 1942–3 the total dropped 30%; soon thereafter some graduate schools were reporting to the American Council on Education that "the graduate student is practically extinct." Probably many men of the war generation, who under normal conditions, would have taken graduate work will in consequence of the war never do so. Some will be casualties of some sort; many more will not undertake graduate training because of unwillingness after several years in the service to delay yet longer, by further schooling, an established adult life. After the war, as President Conant of Harvard has remarked in his last annual report,

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* This symposium was held on Tuesday morning, September 12, during the 52nd Annual Meeting of the APA. The papers, with the exception of that on "Post-war Problems Relating to Radio and Television by Frank N. Stanton and Paul F. Lazarsfeld, which is not available, are published in this issue in order to bring them before the Members and Associates who could not be present at the Cleveland meeting.

"Three or four years will elapse before the normal flow of civilian students from the undergraduate colleges reaches the graduate level"; during that time there will be almost "no college graduates of appropriate age interested in graduate study except discharged soldiers and sailors."

If the large output of our graduate schools just before the war was any indication of need (and there seem to be few complaints that the country is overburdened with people with advanced training), and if as appears probable the need for men with technical training grows after the war, a severe post-war shortage of such men thus seems inevitable. And post-war planning should consider ways by which the graduate schools might catch up on this need. But there are two other good reasons, possibly helpful in this matter, for special consideration of graduate programs at this time. Immediately after the war those "discharged soldiers and sailors" who will make up the bulk of the graduate school enrollment will present many special problems. They will be—to quote Conant again—"young men in a hurry" and (he adds) rightly so; the able and energetic young man who is eager to get into his career after the delays caused by the war is the kind of young man the universities want. They will be older than the pre-war graduate student, and mature beyond their years. Many will have had special training or experience relevant to their graduate school programs. They will rightly expect not merely lip-service to these facts but some real adjustment of university requirements and procedures to meet their special status and needs—and may not be too patient if all this is not forthcoming. Such adjustments should operate to expedite their progress toward their degrees, and so tend to relieve a little the shortage of men with graduate training.

A third reason for review of graduate programs now is more basic. Now may be the psychological moment to attempt certain long overdue fundamental revisions of them. In particular the program for the doctorate needs scrutiny. Introduced from Germany in the middle of the last century and put on top of a program of general education (the American high school and college) very different from the German, it has since then changed less than any other part of our total educational system—has adapted practically not at all to the American program which it caps, nor to changing circumstances and needs. Such modifications as there have been—the raising of "standards" but with little consideration either of their value or of the soundness of the means employed—remind one of the old dementia praecox case of whom it was said that "as the years pass, she becomes more and more like herself!" Perhaps this time of many changes is the golden opportunity at long last to bring about some adaptive change in the doctorate. And such change might, in one way or another, alleviate the threatened shortage of young scientists from whom must come the scientific leadership of the future.

Three Needed Changes in the Doctorate. What then have been the important faults of the program for the doctorate? Basic is this: it is not planned in congruence with clear and realistic thinking about its objectives on purposes. As imported from Germany eighty years and more ago its purpose was clear—to train men for research and scholarship. But there have been sweeping changes in circumstance, need, and function since then. And as Dean Jones of the Harvard Graduate School of Arts and Sciences has said in a recent vigorous address (*2*)

> The graduate school of arts and sciences cannot indefinitely claim research as its primary raison d'etre. It has become a professional, even a vocational school giving professional and vocational training in the same spirit as the law school, the medical school, or the business school.

The realistically logical step is therefore to find specifically what kinds of work people with the doctorate actually do, and then plan graduate programs to prepare them for such work. It was thus admirable that Dean Guthrie's first step, as chairman of the APA committee on graduate programs, was to take such a position, and to turn to Dr. Marquis's admirable inquiry regarding the kinds of work actually done by psychologists for evidence as to what those tasks were. And it is heartening indeed that both this committee and Dr. Moore's analogous AAAP committee are putting stress upon internships and other means of giving real experience under guidance in the doing of various types of professional work. Such steps warrant hope that we may some time get away from the smug assumptions on which most graduate departments in fact seem to operate: that almost any type of psychological training (just so it includes a large dose of good orthodox so-called fundamentals) prepares for almost any kind of psychological work, that training and experience in the actual doing of a particular type of professional work are relatively unimportant if only there have been enough courses and readings about it, and that nothing of sufficient worth to deserve academic recognition is ordinarily learned anywhere than on a campus.

In this last connection a recent statement (7) by Dean Seashore of Iowa is of decided interest:

> If the function of our graduate schools is to train students to use the world's knowledge and to add new knowledge to it, surely both faculty and students on war assignments can secure through direct experience a more stringent training, a clearer insight into world problems, and thus make a more vital contribution to the advancement of knowledge than would have been possible within the libraries and laboratories of their pre-war world. . . . The war is a school. Are these graduate students getting higher education for a learned career? The answer is yes.

If students now in the services or war work may be made to feel that such is indeed the graduate school attitude, more of them are likely to return to the universities after the war. And if graduate schools really will count relevant war or work experiences toward a degree, then immediately after the war graduate programs may for many returning service men be thus accelerated.

But will the graduate schools, really, count such experience? Or having given lip-service to its value, will they continue to award degrees entirely on the basis of the usual thesis and examinations? And that brings us to the second basic fault of the usual doctorate program—the narrow, onesided, in large part irrelevant, demonstratedly grossly unreliable, outmoded methods of determining a student's fitness to receive the doctor's degree. In this audience are specialists in measurement and evaluation and in personnel. What would you think of a procedure for determining whether a candidate should be awarded a life certificate as competent in scientific and academic practice which actually made a point of *not* considering the candidate's record to date, which included no determination of ability to do most types of work involved in such practice, and which made the final decision on the basis of examinations which were improvised off-hand on the spur of the moment—and I submit to you that most questions on most oral examinations deserve to be so characterized. The speaker believes he can claim to be the first person to investigate experimentally the reliability and validity of graduate examinations (5, 6). Simple little experiments like having the same unhappy graduate student take several oral examinations all (supposedly) on the same topic but given by different faculty committees showed reliabilities around .30 and validities also dubious. Somewhat similar research at Purdue (8) led to similar conclusions: "The final oral examination is extremely defective as a measuring device. It is not at all reliable; and even its validity, apart from its unreliability, is questionable." All too often the oral becomes an academic form of trial by combat. And in fact the doctorate examination system is, literally, a heritage from the middle ages.

The situation cannot be remedied simply by improving those examinations. For one thing, the examinations just won't improve; most big departments have been talking about doing that for years, but none seem really to have accomplished much. But the whole approach is in large part irrelevant to the problem. Comprehensive written and oral examinations cannot satisfactorily determine insight in dealing with a clinic case, skill in psychotherapy, sense in handling an industrial personnel problem, or ability in teaching. As our programs for the doctorate become more functional the irrelevancy will increase. The most important and most immediate need is (the speaker is convinced) for an emphatic complete about-face on the vicious graduate school convention (part of the take-over from the German university system) that the final decision as to the awarding of a degree should be based entirely on the examinations. Instead, such very important decisions should be based on *all* the relevant information which can be got. Yes, grades are unsatisfactory. But grades given by at least a dozen faculty members over a four-year period are in total much more dependable than five professors' vote, after two hours' catch-as-catch-can cross-examining of a frightened and half-exhausted candidate and a half hour of jockeying in committee, at six o'clock of a hot afternoon in the last week of school. The consideration should not be confined to grades, however; other evidence regarding the quality and nature of a student's work (and his abilities and personality) should be included, as systematically gathered since his entrance, in a cumulative record. Interne experience and other elements in functional programs can then be given adequate weight. The adequacy of a student's total program (and his over-all competency) can be broadly appraised. The examinations would be kept, but their role would be supplementary. With such a system, relevant experience and training in the services could be adequately counted in, and students with such experience accelerated over what would otherwise happen.

Such a change would have another very salutary and probably facilitating effect on graduate programs. If you asked a student what he was doing, the reply that he was working on the improvement of his ability in counselling or job-analysis or teaching would probably surprise you; but you would accept without question the common answer, that he was preparing for his examinations. And being something of a realist he would recognize (though you might not) that this last task was very different from the first; he would also be acutely aware of its deciding importance. His choice of courses and his professional reading are likely, therefore, to be determined in large part by their examination-preparing value. For this purpose, he stuffs his mind to bulging with miscellaneous lore most of which he will never use again. He pores over files of old questions, takes part in post-mortems on others' examinations, practices question-and-answer with other students. Being a practical psychologist, he reviews the publications of each member of the committee and closely studies his hobbies and his prejudices. It seems not too much to say that the average doctoral candidate gives his most anxious attention and over half his total time to these preparations—and that much of this time is wasted and most beside the point so far as preparation for the actual professional life-work is concerned. Particularly will such preparation for examinations and for committee-men be irksome to returned service men, who will have less time and less patience for academic conventions and small politics. A graduate program stream-lined to go straight for sound objectives of professional training, with competence determined progressively by sound means, should do away with most of all that, save time, and give better training.

A third and last fault of American programs for the doctorate may be briefly mentioned indeed; the degree has been taken too old. The average pre-war age of a bit over 30 meant that a man was past his most healthy and vigorous years physically, and as Lehman (3) has shown, past some of his most creative years intellectually, before he finished his preparation and got into his life-work. Men who have lost time in the war will probably get the degree still older. This fault was not part of the German program, as was strikingly shown (4) by data from a 1916 international who's who in science. The median age of receiving the doctorate was 30 for Americans educated throughout in the United States, but was 24 for Germans educated throughout in Germany. The most important factor would appear to be the delay in completing general education in this country; a German youth might complete the gymnasium at 18 and move into his graduate program, but college graduation in this country averaged 23. In this connection a statement of Dean Jones of Harvard in the paper above mentioned (2) is heartening: "I do not see any reason in nature why a four-year undergraduate course should be the prime prerequisite to graduate training." And he declares that if there are returned veterans who "have not been to college at all but who are mature and who can be found by appropriate tests to be proper candidates for graduate school work, surely the wise thing, the gracious thing, the educationally sound thing is to see that they get the kind of education which their intellectual maturity suggests they need." Perhaps if veterans are thus sensibly dealt with, the practice may spread, and others admitted to graduate work on the basis of fitness rather than degrees.

Means for Bringing about Change. In short, graduate programs need to be made more functional, the means of student appraisal changed accordingly, and programs begun at an earlier age. If these steps were taken, much acceleration to catch up on the war-caused decreased output of our graduate schools should be possible. But as mentioned earlier, graduate programs in this country have shown very little tendency to change. Are there (and here is indeed the most difficult problem) means by which action by the governing boards of graduate schools might be accelerated! My first suggestion is that our national organizations should play an increasing part not only in planning but also in vigorously supporting constructive change in professional training in our science. The committees above mentioned have made a fine beginning. Departments now have a considerable freedom of action within the limits of which they can put into effect certain recommendations of these committees. But might it not be desirable that (for instance) after careful study presumably by one of these committees the APA should officially endorse admission to graduate study on the basis of fitness rather than an undergraduate degree, and recommend means for determining such fitness? Might the Association develop such a graduate student personnel form as suggested a minute ago and, if trial by certain departments shows its worth, recommend a broadened record-appraisal system to graduate schools? The examples may be poor. But I do believe the Association should concern itself far more vigorously than in the past with programs of professional training in psychology.

Certainly veterans coming to graduate school after the war will deserve every reasonable consideration. They will present many problems. Many will have been officers; they will be mature, able, and used to responsibility. Now, students in most graduate schools have less opportunity to affect policy than do undergraduates in many colleges or even youngsters in some high schools! Right after the war should be an almost ideal time to try whether graduate students cannot be given more hand in things. For some years the Department of Psychology at Ohio State University has had an arrangement by which the graduate students each year elect three of their number who sit as regular voting members in almost all department meetings. Most of us feel the arrangement has been very worth while. I have ventured to suggest that there be student members of the Graduate Council—and been told that that would go much to far. Maybe so, though it is here interesting to recall that, in the early days, graduate students seem to have been more active than faculties in making the doctorate really amount to something (1). But some form of real participation by students should bring invaluable help in understanding and dealing with student problems especially those of returned veterans, should lift student morale, should be excellent "interne" experience for those students headed for university careers—and might help accelerate graduate school reforms!

My last suggestion may seem so simple that you will give it little attention—but I consider it most important of all. Academic problems are now dealt with by procedures essentially legalistic and political; the faculty argues, ponders expediencies, and votes its opinions or prejudices. And an idea is not really tried until after it is adopted! How stupid! Instead might the procedures (or at least the attitudes) often be more those of experimental science? Might what could be called the *experiment in practice* become a usual way of dealing with an academic problem? If admission to graduate school without an undergraduate degree may be desirable, then try it with some good students, carefully determine how they do, and base further action on the outcome. Try putting some students on a graduate school committee. Yes, try variations in methods of examination and student appraisal, and see how they work. If only the experiment-in-practice could become a regular and accepted way of going at academic problems, the adaptability and flexibility of educational methods would, I believe, be increased many-fold.

Resume. We are now in the midst of a serious constriction of our sources for the scientific leadership of the future; as soon as the war ends we will be faced with many new and perplexing problems of graduate training. If admission to graduate work could be on the basis of ability rather than degrees, and both programs and means of determining a student's success in them made functional, then a vigorous distinctively American system of graduate training might after the war at last develop. And the output of young scientists should, as one consequence, be accelerated. If the two groups most concerned—the profession as represented by its national organizations, and the students—could find ways to become major participants in this development, and if only all concerned would deal with problems of scientific training like practical experimental scientists and not like lawyers, then such outcomes should quite readily, come about.

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PSYCHOLOGICAL ADJUSTMENTS OF DISCHARGED SERVICE PERSONNEL

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The transition of the service man from military service to civilian life is a process which will challenge the resources of our social structure, and especially the resources of our professional services. Already the transition is under way. Army Separation Centers are in operation, the Veterans Administration is expanding daily, universities are being offered contracts for counseling service to veterans, the GI bill is beginning to operate—these and many other developments point to the fact that the machinery of readjustment is slowly, creakingly, getting under way. Not every one is aware of the fact that more than a million and a half men have already been discharged since Pearl Harbor. The process of transition to civilian life is very much a problem of the present, as well as the future.

Psychologists have not only a significant part in this social process, but a deep interest in the individual soldier and the psychological adjustments which he is called upon to make in becoming a civilian. It is toward this latter aspect that the present paper is directed. It is not a field in which research investigations are as yet available, but we are obligated to examine the casual evidence and the trends in order that psychologists and the psychological profession may intelligently relate themselves to the issues involved.

What are some of the psychological problems of the returning service man and woman? The Separation Centers during their experimental period of operation found that from 65 to 85% of the men wished counseling help of one sort or another. What are some of the adjustments which are most frequently necessary, both as seen by the men and as seen by those who come in contact with them?

Vocational Readjustment. In the first place, there is the psychological problem of relating earlier peace-time vocational skills, and recently learned military skills, to a present occupation. This task of vocational adjustment is a large one, better discussed by others. I mention it first because it has received so much attention, not necessarily because it is most important. It might be pointed out that it represents a trap of a most subtle sort for psychologists. If we regard the readjustment of the service man as centering around the measurement, diagnosis, and allocation of vocational skills, we will not only be performing our function most inadequately, but we are likely, in time, to find our profession much discredited. There are other problems which cut deeper into the adjustment of the individual than the question of where he will put his abilities to work.

Hostilities. One of these deeper problems is that of the pent-up resentment and hostility which is so frequently manifested by the returned man, and which has been an aftermath of every war for centuries. In a small study which I was privileged to make of aerial gunners returned from combat, more than half of the men were deeply resentful of military discipline in this country, two thirds were resentful of their present assignment, and forty per cent showed hostility toward civilians (**3**, pp. 13–15, 43–45, 47–49). Some examples may illustrate the situation. One gunner, an intelligent college man, says: "At home I went to a football game. I've always enjoyed them. But all that life and gaiety and luxury—it just makes you so mad, I never even noticed half the game! I just sat there getting madder and madder—even though I know they can't help it." Or another man, also high calibre, blurts out: "I think the best damn thing we could do is bomb half a dozen towns here! The people don't know there is a war on!" Another tells of talking with an old acquaintance, a man who had not been drafted, and suddenly knocking him down. "I shouldn't have done it, but I don't feel sorry." The various frustrations of the veteran's return to civilian life, and the boiling resentments which occur, are well portrayed in a recent semi-fictional article by Hersey (**2**), and also in the book by Waller (**4**).

Whether we regard these hostile reactions as due to the continued frustrations of military life, or to a lowered self-control due to combat fatigue, or to the release of repressed aggression in the battle situation, or to the basic injustice which sends one man into danger and keeps another safe, or to the many thwartings which are experienced upon re-entering the civilian world, they are an important present problem with which we must learn to deal. We shall see such attitudes in industry, in our schools and colleges, in the home, in our social and political organizations, and in each one of these settings they will cause difficulty.

We have come to know, in individual therapy, that hostility and aggression may rather rapidly be dissolved by permitting free expression of these attitudes in an understanding atmosphere, in which such bitterness and hate is accepted, without approval or disapproval, as a part of the individual. Will it be possible to translate our methods rapidly enough into group and social procedures to enable us to handle this problem? It is too soon to know. But a "hardboiled" veteran officer was probably expressing a deep truth when he said, "I think if when I get out the world treats me soft, I'll be soft. If it treats me hard, I'll be hard and bitter. That may not be the right attitude, but that's the way I feel."

Disturbances of Self-Esteem. A third major group of psychological adjustments are those in which a disturbance of the man's sense of adequacy is involved. There is, for nearly all returning men and women, a sense of strangeness about civil life, even to the extent that men feel incapable of handling jobs at which they worked competently for years before the war. There is the feeling of those who return to college that the world of books and intellectual things is fearful and beyond their grasp. There is, above all, a sense of loss of status. Servicemen and women have been part of a struggle upon which the attention of the world was focussed. To drop out of this, to become one citizen among millions, unsupported by a widespread social purpose and a far-flung social group, is a difficult loss to assimilate. With some, the drop in status will be much more sharp, as in the case of air-force majors and colonels, whose peace-time tasks will be sharply reduced in prestige and pay. The blow to self-esteem is very great, and the psychological reaction correspondingly deep.

A part of this disturbance of adequacy will also come from the conflict over the man's desire to remain dependent. The psychological satisfaction of having decisions made by others, of taking little personal responsibility, is as great in this war as in the last, and already men are debating whether they dare to face the demands of civilian life for greater independence. As one officer put it, "I think I'll stay in the service where I'll at least be sure of my three squares a day." Many men will be definitely in conflict as to whether they have the fortitude to launch out again as independent individuals in peace-time living.

In some instances, self-esteem has been given a body blow by the practice of labelling men with diagnostic labels. If the psychological mistake of the last war was the loose use of tests and test results, the parallel error of this war has been the indiscriminate labelling of men as psychoneurotic and the like. We have a phonographic recording of the counseling of one such returned man, an officer, whose neurotic difficulties have been made much worse by being told by a nurse and a psychiatrist all the details of his psychological illness. He knows that he is regarded as having psychasthenia and obsessive compulsions. He has been told that "if the thing ever goes too far, there is nothing they can do for me." The psychiatrist's statement that he might come to a point where he would live in a world of his own greatly upset him. "I think that scared me more than anything else." It is not surprising that he says, "I don't know exactly whether what was wrong with me at first bothers me as much as the fears that have been created in me since then." Far too many men have had their adjustment to later living made more difficult by such professional labelling, which whether correct or incorrect, creates new problems and fears for the individual to meet.

Uncertainty of Purpose. There is another significant cluster of adjustments which the serviceman is called upon to make, and these have to do with purposes and goals. Both experimental data and common sense point out that a clear-cut purpose is one of the basic elements of morale, individual or group. Yet present facts indicate that millions of men will leave the services with no clear or realistic goal. In the group of gunners previously mentioned, slightly over half had no clear concept of what they wished to do when the war was over. With the minority whose aims and goals are definite, little difficulty need be expected. But the men who will prove to be real problems of adjustment to themselves as well as to society are those who make such statements as these: "I haven't the foggiest notion of what I'll do after the war"; "I might stay in the Army. . . . I wouldn't make any definite plans right now, though"; "I'd have to make a new start. I don't know what I'd do"; "I don't have any plans. I never make plans. The things that I've planned for never come to pass."

We should not suppose that this lack of well-defined aims is limited to those who have had no work experience, or to those whose jobs have been lowgrade. A lawyer with experience behind him, whose place in the firm was open to him when he was discharged, was as much perplexed as to what he wanted to do as the man with no previous job. We should also avoid the error of supposing that such lack of purpose will be overcome by forcing men—I believe the new term is processing them—into vocational slots which some psychological expert regards as wise. Purposes of a lasting sort do not develop in that way. Men must be helped to discover the goals, vocational and personal, which they wish to attain, and to adopt them by self-initiated choice.

Combat Residuals. The service man who has been in combat will find it necessary to make another set of adjustments to the residuals of combat strain which still exist in himself. From the limited information now at hand, it appears that some of the most common after effects of combat strain are increased restlessness, disturbed sleep, and a tendency to be hyper-emotional. Mildly neurotic symptoms occur not infrequently. How long these unusual behaviors will continue to be a problem to the individual is not yet known. No doubt much will depend upon the type of environment which he meets, and the degree of understanding he receives.

Restlessness seems to be the most marked of these residuals of combat, and in one study was found to be evident in moderate or marked degree in 70% of the combat gunners (3, pp. 35–38). Frequently they feel that this desire to be "on the go" is more marked after combat than during the combat period. A typical statement made by one of the men is as follows: "I'm too restless. I'm more nervous now than when I was in combat. I have bad dreams at night—dreams of my buddies being shot down and things like that." Another man simply says, "I feel tense and jumpy all the time." Another puts it in this fashion, "I've been more jittery since I returned than I was in combat. It's not so bad now, though. I'm restless and I can't keep still. I *must* keep on the move." The symptom of sleep disturbances is not so frequent, but is something of a problem to nearly half of the men. And in some instances, the men recognize their own greater reaction to emotional stimuli. For example, "I'll tell you something silly that's been happening to me: In a movie where it is the least bit sad, I want to cry like a baby. I never did that before." The men themselves recognize that all these combat symptoms tend to decrease when they are placed in a satisfying job.

Marital and Family Adjustments. In the field of family and marital relationships, the outstanding problem is the tendency to grow apart. This is probably most marked in the man's tie to his own parents. So different have been the experiences, the values, and the standards of parent and son during the war years that in many instances, unless parents are unusually flexible, the basis of common understanding will have almost completely disappeared. To a somewhat lesser extent this will be true of the man's relationship to his wife and his own family. The community of interests which existed before the war is likely to be sharply reduced.

The picture will not be dark in all cases. Some men, while overseas, found their deepest source of security in their knowledge that they had affectionate, interested wives back home. There is even some indication that this sense of security was associated with freedom from combat strain (3, pp. 30–35, 38–42). In such instances, the readjustment will probably not be too difficult, and will consist in part of overcoming the idealization of the partner during the period of separation.

For many men, however, the adjustment to marital life will be difficult indeed. They will find it difficult to give affection, having long been in a situation where this was unnatural. They will find that physical sex appetites have tended to become divorced from romantic and affectionate feeling. They will find that their explosiveness, their irritability, will crop up in marital, as well as vocational life. Impatience, restlessness, bitterness, are not good ingredients upon which to base family life, as more than one veteran will learn to his (and his wife's) sorrow. As one man put it, "The hardest thing for a woman to learn is to put up with a combat man. A woman can't understand. You get to be sort of strangers."

There can be no doubt that the post-war divorce rate will be high. Students of the situation predict that it may reach a ratio of nearly forty divorces for every one hundred marriages (1). It is likely, if the experience following the last war is repeated, that marriages contracted during the early post-war period will also be very unstable. Consequently, there is every evidence that there is an enormous field for psychological effort in assisting men and women to accept each other realistically, to build a new and satisfying marital relationship in spite of the factors operating against such stability.

Adjustment to Handicaps. The readjustment of the wounded, the disabled, and the psychoneurotic back to normal civilian life is a whole field in itself. It may be said that the handicapped soldier must make all the adjustments which have been mentioned, and that they exist for him in aggravated form. His bitterness is greater, more difficult to overcome. His sense of adequacy and self-respect and self-esteem is more deeply damaged. His purposes not only need rethinking, but complete reorientation. He is likely to have to deal with marked signs of combat strain. The difficulties of his adjustment to family and marital life are multiplied.

In short, the handicapped man will need not only a whole range of technical aids—specialized medical treatment, artificial limbs, vocational retraining, special vocational replacement—but he will also need thorough-going psychological help which will enable him to make the inner adjustment to his changed status. Unless this help in the realm of purpose, motivation, and self-acceptance is forthcoming, the other aids may go for nothing.

Some Possible Errors. Thus far we have surveyed very briefly some of the areas of psychological adjustment which the returning soldier will face. As we consider the past history of the psychological profession, it is easy to see that there are several ways in which the profession may fail to measure up to the challenge which exists. In the first place, it may disregard one or all of the areas which have been described. This seems incredible, but actually psychology has not always seen or understood the adjustment problems of the individual. The study of the characteristics of the group and of the average individual can lead to a curious blindness to the dilemmas of the individual as a unique person.

In the second place, psychology may focus its attention upon the atomistic, the superficially scientific aspects of the problem. It may center upon the measurements of abilities and aptitudes in relation to jobs. It may do so to an extent that this becomes an end in itself, and the living organism who possesses these abilities is forgotten. The history of psychology is replete with instances of just this sort of professional shortsightedness.

In the third place, the psychologist, called upon to expand his functions during this period, and excited by the opportunity to use his technical professional tools, may come to regard himself as Jehovah, may take unto himself an authority for directing and regulating individual life which is totally incompatible with genuine democracy, and with a reasonable professional humility. Both in our own profession and in sister professions, we see all too much evidence of the ease with which this attitude may grow. If psychology is to meet the responsibilities which the present situation imposes, it will do well to avoid these errors.

Some Suggested Principles. How may psychology be of maximum service to the returning service man in helping him to build a normal and satisfying relationship to peacetime life? That question can only be completely answered by the profession as a whole, as it moves forward in this realm. It may, however, be constructive to list for consideration certain principles which would appear to be sound in any approach to the discharged man.

1. *Treat him as a whole individual, not in atomistic fashion.*

No veteran is merely a man without a leg, or an AGCT score of 95, or a mechanical aptitude at the 85th percentile, or a compulsion neurosis, or a personality test profile. He is a totally functioning organism which may include such items as these, but in which the total is more than the sum of its parts. He must be treated as this total individual if we are to do an adequate job.

2. *Recognize the importance of emotionalized attitudes.*

In the past, we have tended to be concerned with abilities rather than attitudes. Perhaps the learnings of the war have convinced us that the dynamic forces of personality are as important as the abilities which the individual possesses.

3. *Recognize the importance of release of feeling, and acceptance of feeling.*

In dealing with the aggressive, irritable, attitudes which will be so prominent, as well as with the feelings of confusion, it should be fully realized that the most constructive method of handling these attitudes is to permit them to come fully into the open, without argument or denial, but with acceptance of the person who has these feelings. This will also be true in dealing with the deep and involved feelings about handicaps. To treat the disabled individual casually is all very well, if at some point he has the opportunity to get out of his system all the deep emotional disturbances which his handicap has caused him. Consequently in all dealings with returned men, ample opportunity should be provided for release of emotionalized attitudes.

4. *Build on the man's ability to readjust himself, once he has come to see his situation more clearly.*

One of the deeply frightening things about the future is the growing distrust in the individual's ability to do things for himself. If as a people we lose that faith, and our institutions increasingly take over the individual's responsibility for himself, then the implications are very grave. This seems all the more unfortunate since a growing body of experience in therapy indicates the most amazing capacity on the part of the individual to face his situation and deal with it constructively, if he can see it clearly, unhampered by repressions and defensive mechanisms which obscure his own perception of himself. When there is adequate release of pent-up feeling, and thorough-going acceptance of that feeling on the part of the psychologist, then it will be found that the individual has many psychological resources for dealing with the situation himself.

5. *Assist him in discovering satisfying purposes.*

If we do not give first attention to motivation and secondary attention to guidance and placement, we shall be putting the cart before the horse with a vengeance. Thousands of dollars will be wasted by measuring, diagnosing and processing men who have as yet no desire to be placed in a job, or guided in education, because they have not found within themselves the purposes which would make a job or an education a realistic part of life. We need sufficient vision to recognize that a profoundly important psychological task is to help the man to explore his attitudes, his situation, his confusions and his dread of the future, until he begins to see some things which he himself wishes to attain. When he reaches this point, then our various guidance techniques have meaning. Until he reaches such a spontaneous formulation of his aims, guidance is more than likely to be useless.

In a very real sense, the future of psychology is bound up with the way in which we render professional service in meeting the most far-reaching question of the coming decade—the assimilation of the veteran into community life. This paper has endeavored to point out some of the problems and raise some of the issues to which we should give our most critical attention. We have need to be concerned not only with the technical questions involved in each area of psychological effort, but also with the over-all issues of professional strategy and professional philosophy. Our success or failure will hinge to a large degree upon these latter considerations.

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OCCUPATIONAL AND VOCATIONAL COUNSELING OF MILITARY AND CIVILIAN PERSONNEL DURING THE PERIOD OF POST-WAR DEMOBILIZATION AND THE YEARS IMMEDIATELY THEREAFTER

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We estimate that 20 million persons in the armed services and in present civilian employment will change occupations in the conversion and post-war periods. Many more persons than that will change jobs but remain essentially in the same occupations. Thousands of women and older workers will leave the labor market, but again thousands of youths will enter the labor market for the first time. Such a vast readjustment in our occupational life will require everything that we have in trained personnel, information and techniques. Research over the years provides only a small part of the occupational tools that are required to do the job.

A few months ago, a committee was formed, under the chairmanship of Dr. Ernest Jaqua, by the War Manpower Commission to consider problems regarding the training of some of the personnel to do this huge counseling job that is going to be required in the readjustment period. Persons representing the armed forces, industry, education, and government, were members of this committee. The committee limited itself to positions which are called "Vocational Counselor." The first thing that was done by the committee was to attempt to determine the duties and qualifications of a vocational counselor and the number of these counselors that might be required during the period of readjustment. Exclusive of the armed forces and private industry it was estimated that 12,000 to 15,000 would be required. In outlining the duties of the vocational counselors a composite description of a family of counseling positions was prepared. This description was based upon job analysis reports of counseling positions, U. S. Civil Service Commission data, information from schools and colleges, and other data. It was believed that vocational counseling requires the same basic qualifications whether the person is engaged in vocational counseling in a school or college, in a government agency, or in industry. Thus, if a person could be trained to meet the basic qualifications of this job family he could qualify for employment in a variety of counseling situations and could transfer, after initial employment, among the various institutions and agencies as opportunity permitted.

An outline of training units was developed by the committee to meet the requirements set up in the job description. Obviously, training in psychology is one of the basic requirements. However, by far the greatest demand for vocational counselors will be for those who have not only a background in psychology but likewise training and background in occupational trends and their interpretation, occupational and industrial information, physical disabilities and their occupational significance, and industrial and governmental personnel practices. The training of such counselors by a university necessarily involves courses in the business school, in the school of education, the department of psychology, and perhaps in the school of medicine.

Obviously there are not going to be enough trained vocational counselors to fill all of the posts where trained vocational counselors are required. We will find psychologists who know little about jobs or the labor market, economists who know little of psychology, engineers whose knowledge of industry may be superb but who have not been trained in the other phases, and many persons with practical work experience but little academic training. Federal Governmental agencies, I can say, will attempt to compensate for the lack of training by giving intensive on-the-job instruction and by arranging short courses with universities and colleges. Arrangements for short courses and refresher courses have already been worked out between Government agencies and a number of universities.

In respect to psychologists a Sub-Committee of the Emergency Committee on Psychology has now begun a study to determine occupational standards and opportunities for psychologists in the post-war period. This committee is obtaining available data from the U. S. Civil Service Commission, State Civil Service Commissions, schools and colleges, clinics and hospitals, and from private industries. Many of you here may be requested to supply data. The Committee will cover all jobs requiring psychologists, not just those involved in the counseling of veterans and displaced war workers. It will also attempt to list occupations for which psychological training is apparently beneficial even though a professional psychologist is not required for the position. Such findings should aid in broadening the opportunities for psychologists in the post-war period and should stimulate universities to offer instruction that is carefully matched to the duties and qualifications of the positions. As in the case of Vocational Counselor, appropriate short courses and refresher courses will be required in order that many can become better qualified for the opportunities in psychology that will prevail. While the problem of trained personnel is much broader than that of vocational counselor or psychologist, it is believed that if we can improve and expand the proper training for these technical personnel, the counseling job to be done has a much better chance of success in the days to come.

Now, I should like to discuss some of the research developments in preparing for this vast counseling job. Counseling is going to be done by many agencies and institutions. There will be more than enough for everyone to do. Tools and techniques carefully applied will be required to make this job a success.

We estimate that there are over 30,000 separate jobs or occupations in industry, business, education, agriculture, and the armed forces. In the *Dictionary of Occupational Titles* we have been able to define and classify approximately 22,000 occupations. These occupational classifications are used in the United States Employment Service, the Veterans' Administration, the armed forces, and by many schools, other agencies, and by private employers. The definitions and classifications were developed from nearly 100,000 job analyses made in various parts of the country. Additional coverage of jobs is being obtained continually.

While the definitions and classifications of these specific occupations are widely used throughout the country, it has been found necessary to develop a classification for entry fields of work in order to aid in the counseling, training and placement of veterans and displaced war workers who have limited occupational experience or who, because of circumstances, plan to enter a field of work or an occupation different from their accustomed job. A preliminary classification of entry fields of work was developed in 1941. We have now completely revised and enlarged this document. It will be off the press next month and is known as Part IV of the *Dictionary of Occupational Titles*. It has the following characteristics:

1. In the entry occupational classification, occupational activities are grouped into six general groups with further sub-classifications arranged according to a five digit classification plan. One major grouping, for example, is manual work. Manual work is defined and is broken down into three fields; namely observational work, manipulative work, and elemental work. Each of these categories is, in turn, divided into several more specific fields. A job seeker or a person seeking training may be classified for placement or training in a broad category or in narrow category according to his background and interests.
2. For each entry occupational classification, illustrations of specific jobs for beginners in the field are shown and also the "promotion to" jobs are revealed which the beginner may achieve after experience.
3. In using the entry occupational classification, a counselor can readily survey with the counselee the general fields of work according to meaningful categories rather than attempt to counsel in terms of thousands of specific occupations.

Part IV has also been useful and will continue to be useful in classifying training courses and in outlining training programs. Part IV is designed to be used with other occupational tools including trade and aptitude tests, job descriptions, information concerning training facilities, labor market information, job families, and the like. A new simplified interest questionnaire has also been developed which is directly related and can be interpreted in terms of Part IV entry classifications.

Transfer from military to civilian jobs. We estimate that there are approximately 3,000 occupations in the armed forces when they are grouped according to the same standards we use in the classification of civilian jobs in the *Dictionary of Occupational Titles.* It is, of course, necessary to know the relationship between military jobs and those found in civilian life.

In the entry occupational classification just described, there is also an index of military jobs showing the related civilian fields of employment for each military category. Similarly a listing of civilian vocational training courses is provided whereby any course so listed can be related to the fields of work to which it has application.

The relating of military jobs to fields of civilian employment is not enough, however. In the counseling of returning veterans it is also necessary to know what specific civilian occupations are most closely related to military specialties. During the past months we have been studying these relationships and documents showing tables of related civilian jobs for both Navy and Army jobs are now available for purchase from the Superintendent of Documents. These cover enlisted men's jobs only. Officer jobs are in process. For each military job a list of 20 to 30 civilian jobs is shown. Also included are brief estimates of the kind and extent of training which is required to achieve proficiency in the civilian occupations. For each group of related civilian occupations there is also shown a list of the major physical activities involved in those jobs and the typical working conditions under which they are performed. By the use of the *Dictionary of Occupational Titles* or by appropriate job families it is possible for the counselor to expand further the list of related civilian jobs originally shown. These tables of related jobs are used by the Army and Navy in their counseling as well as by the United States Employment Service and the Veterans Administration and other agencies.

Form 100, separation qualification record of the Army contains space for the civilian conversions of the military occupations. The Navy will also issue a list of appropriate related civilian jobs to each individual discharged. Thus each veteran at time of discharge will be given information regarding related civilian occupations. When a veteran is given counsel by a civilian agency later, considerable time should be saved if the veteran has this information in his possession. The separation forms used by the Army and Navy are not limited of course to related civilian jobs. They include military occupations, service training courses, off-duty-educational courses, name of employer last worked for, usual civilian occupation, highest school grade completed and other information.

At present the United States Employment Service is making 50,000 World War II veteran placements per month.

Aptitude tests. A good deal of the research done during the war in aptitude testing may be very useful in our counseling of veterans and displaced civilian workers. We need to know much more, however, about the civilian occupational significance of tests given in the armed forces. Some veterans will have in their possession a list of tests taken and scores obtained. What do these scores mean in terms of fields of work, occupations, and jobs?

During the past ten years, the Division of Occupational Analysis, now located in the War Manpower Commission, has developed as one phase of its program aptitude-test batteries for about 180 different occupations.* Most of these batteries are for the purpose of selecting applicants for specific jobs or training courses; a few are designed to select applicants for general fields of work such as clerical or machine shop occupations. The validation procedure employed by the Division involves a number of steps. After a complete job analysis has been made, an experimental battery of tests is administered to a carefully selected experimental sample. A reliable criterion of work performance is selected, and the experimental tests are validated against the criterion. The best weighted combination of tests which have been found valid for the occupation constitutes the aptitude-test battery. Check studies and follow-up studies are then conducted to verify the validity of the battery for additional occupational samples.

The difficulties encountered in aptitude studies have to do chiefly with the development of a reliable criterion and with the selection of the experimental sample. It is very difficult to find a large occupational sample for whom a comparable criterion is available. Another problem is that an aptitude-test battery standardized entirely on an employed sample will distinguish good from poor employees but its validity for differentiating the employed population from the general population is unknown. For example, adding machine operators have more numerical facility than the average but no arithmetic test occurs in the adding machine operator battery because it did not show sufficient validity in differentiating poor from good operators.

We have constructed about 120 tests. Three factor analysis studies of these tests have been completed and two more are in process. The following factors have thus far been identified: verbal, numerical, spatial, reasoning, perceptual, motor speed, aiming, manual dexterity, and finger dexterity. The latter three appear to be types of muscular coordination, although the aiming factor is found in paper-and-pencil tests of the dotting and tapping types. Manual and finger dexterity differ only in the fineness of coordination and are found in the apparatus tests. All the others are very similar to those found by numerous other investigators.

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* See "Ten Years of Occupational Research," *Occupations* XXII (1944), pp. 387–442.

Within the past year there has been a major shift in emphasis in the program from the development of tools to be used as selection aids to the development of tools to be used in counseling. To meet this need a preliminary general battery was constructed from the specific batteries so far developed. It consists of 24 individual tests including three apparatus tests and requires three hours of administration time. This battery has considerable immediate usefulness for it can be scored for 68 different occupations. However, all known abilities are not adequately sampled and occupational coverage is far from complete. Several investigations are now underway which we hope will provide us with the materials for a more complete general counseling battery with a wide range of occupational norms. In view of the results of our factor studies, some new tests are being developed and some of the old ones will be revised in an effort to obtain pure measures.

A further analysis is now being made of the occupational data we have collected over the past ten years. The means, sigmas, and validities for each test for each occupational group to which it was administered are being compared and summarized so that the occupations can be grouped according to the similarity of test scores and hence of aptitudes of employed representatives of these populations. Broad fields of occupations on the basic aptitudes must be established because it is not feasible to make predictions for 30,000 specific occupations. We are also considering another method of grouping occupations based on an inverse factor analysis of factor scores for specific occupations converted from the test scores.

These various studies will provide a basis for determining the content of an experimental counseling battery and will suggest a preliminary grouping of occupations. It is hoped to limit these groups to 15 or 20 and then validate and standardize the battery for a large variety of occupations. There are enormous problems in this program not only in techniques but in the philosophy of placement of personnel. The assumption that occupations can be classified in significantly different groups on the basis of a few specific aptitudes is yet to be tested. Within each field various ability levels exist. For counseling purposes upper and lower critical scores must be considered as well as mean levels of ability. Perhaps the general battery will serve only as a core battery, after which various specific batteries will be needed to narrow the occupational possibilities for the applicant.

Trade tests. In addition to the aptitude test program just described we have begun a program of developing and standardizing trade tests for peacetime occupations. We find it necessary also to revise many of the trade tests which were developed for peacetime occupations before the war. At present we have trade tests developed for about 250 occupations.

The physical demands of occupations. The counseling of the disabled is a very broad and difficult subject. I can take time to mention only one of the many developments. In the early days of our occupational research program, attention was given to the physical factors of jobs with special consideration to the use of handicapped workers in various occupations. This has developed into the physical demands approach to the analysis of jobs which places emphasis on the physical activities and working conditions. In conjunction with this approach there has been developed a companion technique known as the Physical Capacities Appraisal which is used by the physician in estimating the physical activities which a worker can perform and the working conditions under which he can be employed. It is important that this information be known in order that the physical capacities of a worker may be matched with the physical demands of a job so that the worker may be placed on the job which he is physically capable of performing.

This technique of matching the individual worker to a specific job is believed to be much better than the practice of listing jobs which can be performed by persons with various disabilities since such lists convey the idea that the occupations listed are the only ones which can be performed by these persons. Furthermore, the technique places emphasis on the physical assets of the worker rather than on his liabilities as was done with the listing of jobs "suitable" for handicapped persons. Many employers throughout the country are adapting the physical demands approach to their own employment procedures. It is also possible to prepare general physical demands information from a number of Physical Demands Analyses of the same occupations from several different plants. This composite will need to be verified locally before a handicapped person is placed in a specific job opening. Considerably less time is involved in verifying a composite description than in making an original analysis each time. The general type of physical demands information is useful in the counseling when it is used with discretion.

Added coverage for the Dictionary. The *Dictionary of Occupational Titles* is at present probably the most widely used occupational document in the world. Six thousand copies are in use by the armed forces, civilian Government agencies have obtained 24,000 copies, and private industry has purchased 11,000 copies. A total of 56,000 copies are in use in the United States and foreign countries.

The original preparation of the Dictionary took several years and it was not possible to cover all occupations by the time it was first issued. Since its publication in 1940, supplements have been issued from time to time. The present supplement includes 4,500 definitions not found in the original document. It is estimated that six thousand jobs must be analyzed each year to keep the Dictionary current once all jobs have been initially covered.

In the preparation of the Dictionary the jobs in which the greatest numbers of workers are employed were studied first. Thus the present Dictionary and its supplement are relatively more complete for clerical, sales, skilled, semi-skilled, and unskilled occupations, than for professional and semi-professional occupations. These latter groups are now being given added attention to round out the Dictionary more fully. The Division of Occupational Analysis welcomes comments from the users of the Dictionary regarding jobs which appear not to be covered or where definitions should be revised. Immediately in prospect is the adding of definitions of professional occupations in all industries. Also, concentration is being made in improving the coverage in plastics, electrical manufacturing, and paper and pulp industries.

Conversions between civilian occupations. Conversations between civilian wartime occupations and civilian peacetime occupations are in the process of development. These conversions are being developed on a national scale to meet nation-wide needs, and they are also being prepared to meet a specific need in a given community when assistance is requested.

During the past two years over 8,000 establishments in the war effort have prepared manning tables.* The manning table was used chiefly with the replacement schedule as a tool for an orderly withdrawal of workers to the armed services, in order that war production would be affected to a minimum. The manning table shows all of the jobs in the establishment according to the standard titles and definitions of the *Dictionary of Occupational Titles*. The number and percentage of workers in each occupation by department and total plant is also shown, including the training time for each job. Although other items are also included, the above enumerated items for the 8,000 war establishments are necessary in the development of related occupations between war production and civilian production establishments.

For each of a number of war industries an industrial manning table or occupational pattern has been prepared giving a composite for the industry. This shows the occupations in the industry according to the titles and definitions in the Dictionary, including the percentage of workers in each occupation or group of related occupations. Thus, there is now available considerable information regarding the patterns of occupations in war industries. The patterns are useful in making estimates of the skills of workers to be affected by a future reduction in war production, and the industrial and plant patterns give the correct titles of occupations for which related civilian peacetime jobs must be determined. The tables of related jobs are called Industrial Job Families. They were prepared in considerable numbers to aid in conversion from peace to war. These are being arranged in reverse order to aid in the transfer from war to peace. Thus we will have tables of related jobs to help in counseling the displaced war worker as well as in the case of the veteran.

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* See "Manning Table—A Personnel Blue-Print," *Occupations*, XXII (1943), pp. 20–23.

EXPANDING OPPORTUNITIES FOR WOMEN PSYCHOLOGISTS IN THE POST-WAR PERIOD OF CIVIL AND MILITARY REORGANIZATION

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The title of this paper implies a prediction and a distinction. The prediction is obviously subject to all the hazards inherent in any attempt to forecast the turn of future events. The distinction also enters into the prediction insofar as it implies that the areas of psychological service and investigation for which women are eligible are more or less distinct from those held chiefly by men.

That in the past women as a group have taken a less active part than men in advancing psychology as a science and as a profession is undeniable. The contributions of women to basic psychological theory have been few. The majority of women have shown little aptitude for devising research techniques of wide applicability, for formulating new problems or searching out new approaches to old ones. Their contributions to the psychological literature have been fewer and shorter than those of men.

A comparison of the number of publications listed in the 1943 volume of the *Psychological Abstracts* for a 50 per cent sample of the names in the *1944 Yearbook of the American Psychological Association* classified according to sex and to type of membership yielded the following figures: Of the men members, 49.5 per cent had published at least one book or article during the year; of the women members, 31.9 per cent had one or more listed publications. For men and women associates, the corresponding figures were 21.0 per cent and 10.7 per cent. The largest number of publications by a single author within the sample tabulated was as follows: men members, 8; women members, 6; men associates, 7; women associates, 3. The average number of publications for men members was 1.03; for women members, 0.61; for men associates, 0.32; for women associates, 0.12. These figures are very similar to those obtained in a study based upon the bibliographies in the second edition of the *Psychological Register* by Professor John E. Anderson and myself which is as yet unpublished. In the latter study it was found that publications by women psychologists are not only fewer in number but on the average they are of shorter length.

In a recent article by Bryan and Boring,* it is shown that women psychologists are not appointed to administrative offices within the American Psychological Association in proportion to their numerical representation in the Association. Bryan and Boring suggest that this may be due, at least in part, to the *scientific* nature of the organization and the fact that women are not usually thought of as *scientists*. Perhaps there is justification for this way of thinking. Be that as it may, since it is not easy for a professional man or woman to achieve more than a local reputation except through publication, the fact that women are less productive than men means that they stand less chance of being elected to office because they are less well known. It is beyond the province of this paper to attempt to account for this difference and it is probably unnecessary to state that there are and have been in the past a good many notable exceptions to the general rule. But on the average the difference exists, and its consequences are both real and inescapable. Moreover, it does not appear that the lowering of the sex barriers to educational opportunity during recent years has greatly affected the sex difference in scientific achievement. During the nineteenth century, few of the large eastern universities admitted women to their graduate schools. Nevertheless, such women as Calkins, Washburn and Ladd-Franklin attained high distinction in their profession.

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* Bryan, Alice I., and Boring, E. G., Women in American Psychology. *Psychol. Bull.*, 1944, 41, 447–454.

Thus, in considering the question of post-war expansion of opportunities for women psychologists, it becomes obvious that at least four factors should be taken into account.

1. We must consider the likelihood that post-war conditions will give rise to increased need for psychological services, particularly in certain fields.
2. There is the question of the competence of women to meet these needs, and of their interest in the particular problems involved.
3. There is the possibility of sex prejudice operating in such a way as to create an artificial but nevertheless real handicap for women who attempt to enter the tabood areas. Such prejudice may operate in either or both of two ways. It may serve as an initial barrier making it difficult or impossible for women to demonstrate their capacity for doing the work at all or, to the extent that such prejudice exists within the group to whom service is to be rendered, it may militate against the usefulness of women for certain types of work, regardless of their ability. For example, if, as some have suggested, many of the returning service men are likely to be distrustful of vocational advice given by women, or unwilling to discuss their personal problems with them as frankly as they would with men, it is evident that women would be severely handicapped in attempting to render such service, no matter what their training and ability may be.
4. Finally and perhaps of chief importance is the question of the degree of initiative likely to be displayed by women in recognizing the areas in which psychological research and service is needed and by their own efforts and accomplishments expanding the opportunities available to them in the post-war period.

Returning for a moment to the title of this paper, I should like to stress the point that the word "expanding" should be regarded as a verb and not as an adjective. We sometimes speak of opportunities as "given" or "offered." In the scientific world, however, opportunities rarely come fortuitously. They must be created. And I believe it is not unfair to say that if, in the past, women psychologists have been accorded somewhat less recognition than men, at least a part of the difference may be ascribed to less outstanding accomplishment. If opportunities for women in psychology are to expand the impelling force must come from within. Women must train themselves to see beyond the little routine problem with which they have too often been preoccupied in the past and concern themselves with larger issues. And they must cease to use sex discrimination as an excuse for their failure to do this. There is not, and never has been, any sex barrier to thought.

What are the chief areas in which women psychologists are most likely to find openings in the post-war period? In an attempt to answer this question, two sources of information were consulted. First, I made a rough tabulation of the positions actually held by women psychologists at the present time according to the information given in the *1944 Yearbook*. This tabulation cannot be regarded as entirely accurate, both because of the possible error involved in judging sex on the basis of name alone, and the further difficulty of classifying occupations from the very brief statements given in the *Yearbook*. However it is unlikely that these errors follow any systematic trend or that they are of sufficient magnitude to affect the general nature of the findings.

As a second approach to this question, I asked a number of the most active members of the National Council of Women Psychologists whether, in their opinion, women psychologists will play a more important role during the post-war period than they have in the past. It is interesting to note that of those who replied to this question, only about 10 per cent gave an unqualified affirmative answer while the remainder were either very doubtful or stated frankly that it would depend upon the women themselves.

I also asked, whether, in their opinion, there are special areas of psychological research or service for which women are especially fitted. This question was almost unanimously asnwered in the affirmative and a wide variety of suggestions were made.* It is interesting to compare these suggestions with the distribution of positions actually held by women as reported in the *1944 Yearbook*. Subtracting the graduate students and those without professional employment from the total number of women listed in the *Yearbook* leaves 127 members and 770 associates holding positions of some kind. I have classified these into a small number of general groups in order to show the kind of work in which women psychologists are now engaged.

For the members, college teaching greatly exceeds all other occupations in frequency, with 52 per cent reporting such positions. Although only 27 per cent of the associates report college teaching as their occupation, an additional 3 per cent are teachers or supervisors in public or private schools including nursery schools, and 4 per cent are doing college personnel work. None of the full members report either of the two latter occupations. Teaching thus seems to be the chief professional outlet for women psychologists at the present time, especially for those who have been most active in the profession.

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* My gratitude is particularly due to Clairette P. Armstrong, Elinor J. Barnes, Evelyn M. Carrington, Esther Allen Gaw, Dorothea McCarthy, Mabel F. Martin, Gladys Schwesinger, Lt. Gwendolyn Schneidler, Ruth Tolman, Maj. Cornelia Williams and Ella Woodyard.

It is therefore somewhat surprising to find that none of the women who responded to my request for suggestions, mentioned teaching as an expanding opportunity for women. This may have been due to the common tendency to overlook the obvious or it may represent a feeling that the increase in the number of university and college positions which seems almost certain to result from the government's plan to finance the education of returning service men and women will be largely or completely taken up by men. Whether or not this proves to be true, it seems well-nigh certain that the new group of students will require far more than the usual amount of educational guidance and personal counselling. This is a field which should appeal to the many women whose major interest is in working directly with individuals. It is also a field in which there is crying need for further research, and to be of most usefulness such research should be begun immediately if the findings are to be available in time to be applicable to the post-war situation. I suggest, therefore, that those psychologists who wish to find places for themselves in this field where the need and the opportunities are almost certain to be great should begin now to investigate ways of helping the incoming service men to rehabilitate themselves to civilian life. Even if men are given some preference for these positions, there will be ample room for women of demonstrated ability, though not necessarily for all those who want jobs.

Clinical work, using the term in a fairly broad sense, has been and probably will continue to be a field in which women psychologists fill a large proportion of the available positions. Of the present women members, approximately 35 per cent list some type of clinical work as their present occupation; of the associates, 46 per cent are so engaged. For the associates, therefore, clinical work outranks teaching with respect to the number of persons engaged in it. This is probably a reflection of the greater number of minor positions in the clinical field. The greatest single source of employment for work of this kind is the public schools, with child guidance clinics ranking next for the associates and private practice holding equal rank for the members. Mental hospitals rank next, while general hospitals and children's hospitals employ only 2 per cent of the members and 3 per cent of the associates. Institutions for the mentally or physically defective, orphanages, and reformatories account for 2 per cent of the members and 5 per cent of the associates. A growing source of employment for the clinical psychologist is found in the social welfare agencies, both state and municipal. Four per cent of the members and 5 per cent of the associates are employed by these agencies. A much neglected type of clinical service is connected with the juvenile courts and the domestic relations courts, Only 1 member and 8 associates, or a total of 1 per cent are engaged in court work at present. Public education is evidently needed here, and this will probably have to be supplemented by enough volunteer work to demonstrate its value before this field can be expanded as it should be.

In view of the large number of women now engaged in such work, the fact that the greater number of the special suggestions from my colleagues regarding the expansion of work for women psychologists have to do with some type of clinical service is understandable. Three groups of persons likely to need such service are repeatedly mentioned; the returning service men themselves, the persons discharged from war industries or voluntarily quitting such work, and the families of both these groups. Both research on these problems and direct service to the individuals affected by them are needed. For the soldiers, there are the problems of rehabilitation and retraining of the war-injured, and of vocational and personal counselling for those who find it difficult to readjust to civilian life. A point mentioned by one of my correspondents is of significance here. She calls attention to the fact that the time when the service men are likely to need most help is not when they are first mustered out or for some time thereafter. It will come with the psychological let-down when they gradually cease to be heroes and are expected to take their places among ordinary citizens without the special consideration which many of them will have grown to expect.

With the return of the servicemen to industry a large number of older workers who have been retained beyond the usual age are likely to be dropped from employment. Moreover, the rapid prolongation of the average term of life has brought about a marked increase of the number of the aged in the general population. The reports of the United States Census show that if the proportion of persons 60 years of age or older in the general population in the year 1900 is taken as a base, the corresponding figure for 1940 has increased to more than 160 per cent of the 1900 ratio. For both these reasons, the psychology of old age and aging become of increasing importance. If there is justification for the popular belief that women are more patient and sympathetic in dealing with handicapped people than men are likely to be, gerontology should constitute an important field of research and service for women psychologists in the future.

There are no dependable figures on the number of women not previously employed who have taken war-time jobs which they will not be able to hold after the regular workers return. Even though many of these women drop out willingly, it is probable that there will be others who will not relinquish their positions without protest. Unless new places can be found for them in industry, or by some system of group education they can be helped to find renewed interests and satisfactions in the home or community, the de-industrialization of women may well give rise to social problems of many kinds. Here is another field in which women psychologists should find work for which their sex is an asset rather than a handicap. The increasing use of women psychologists by social agencies should facilitate the organization and handling of such projects.

Closely allied to the foregoing problem is that of the reorganization of homes broken by war service. Wives and mothers are likely to be faced with many puzzling situations arising from the emotional letdown to be expected in the case of many men who have spent considerable time in active service and who find it difficult to readjust themselves to the routine of home and family life. The relations of fathers and of older brothers to the children from whom they have been so long separated is likely to introduce problems which the untrained wife or mother may feel unable to handle without help. There are also the major reorganizations necessitated when the father of a family or the son who has been its major source of support is either killed or permanently n-capacitated. That clinical work within the home will be greatly needed during the post-war period seems practically certain, but whether there will be direct call for women psychologists to carry on this work is by no means certain. My guess is that unless psychologists are somewhat more active in demonstrating their capacity for filling this need, the problems will either be left unsolved or will be turned over for the most part to social workers and psychiatrists. With reference to this point, one of my correspondents has stressed the publicity value of such volunteer work as community lectures, clinical interviews, publications in both scientific and popular journals and of independent research.

Another area of clinical research and service which several of my colleagues have stressed is that of the problems connected with war marriages and the consequent rise in the divorce rate, as well as the wartime increase in illegitimate births. A large proportion of unmarried mothers are very young, and the importance of helping them to reinstate themselves in society without lasting personality damage is self-evident. Here, again, the woman psychologist has a decided advantage over the man.

Up to the present time, only a relatively small proportion of women psychologists have held industrial positions. By combining those doing personnel work in industrial establishments, those doing industrial research and those engaged in advertising and selling, we find a total of 7 per cent of the members and 6 per cent of the associates now reporting work of this kind. In view of the large number of women employees in industry, the small number of women psychologists in industrial personnel work suggests that this is a field in which there is room for much expansion.

Even more important as a potential avenue for women psychologists is that of advertising. Economists tell us that from 75 to 80 per cent of the American dollar is spent by women. Women are the chief purchasers of food, of household goods, of their own clothing and that of their children; often of their husbands' clothing as well. Theirs is likely to be the deciding voice in the purchase of a new car or a new home. Although the success of an advertising campaign is thus chiefly dependent upon its appeal to women, the major positions in the field of advertising and selling are usually held by men. If women psychologists understand the psychology of women, here is certainly a field that should be both interesting and lucrative.

Approximately 2 per cent of the members and 6 per cent of the associates are now engaged in some kind of special governmental service connected with the war and an additional 1 and 2 per cent respectively are in uniform. Two per cent of each group hold various kinds of state appointments. Five per cent of the members and 4 per cent of the associates are devoting full time to research, usually under the auspices of some specially financed project of a university department. For the most part, all these may be regarded as temporary rather than permanent positions. Government service, however, will probably continue to offer some opportunities for women psychologists with administrative ability.

In summary then, it seems likely that opportunities will not be lacking for women psychologists who take their profession seriously, who are willing to compete with men on an equal basis without demanding special consideration, and who will accept the fact that no amount of faithful work on problems of little importance can compensate for lack of major scientific contribution. Women must cease to rationalize about lack of professional opportunity and demonstrate their competence by actual achievement. Opportunities will expand for those who exert the necessary propulsive force.

PSYCHOLOGY—SOME UNFINISHED BUSINESS

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"The welfare of mankind now depends upon the sciences of man. The sciences of things will, unless civilization collapses, progress, extend man's control over nature, and guide technology, agriculture, medicine, and other arts effectively. They will protect man against dangers and disasters except such as he himself causes. He is now his own worst enemy" (**12** v).

The title of this paper listed in our program might easily imply an exhaustive examination of the present status of psychology and a blueprint for the undergraduate and graduate curricula in the psychology of the future. No such ambitious undertaking is attempted. The occasion and time limitations permit only a rough thumb nail sketch of some of the problems as seen chiefly by one who has worked for more than two decades in the science of psychology and who has strong convictions concerning its importance in potential service to the individual and to society.

In order to implement a campaign for the conquest or liberation of new territory it is necessary to have a thorough understanding of the beach head that we occupy and of the problems of what in military terms are called "problems of logistics"—problems of supplying the advancing forces with ammunition, food, fuel and other supplies. Our psychological beach head includes our philosophical inheritance as well as such scientific theories and knowledge together with such applications of our science as it has been possible to make.

Our philosophical inheritance has unfortunately not been an unmixed blessing. Deriving from that relatively sterile branch of philosophy known as epistemology and nurtured by a rationalistic science which tended to exalt thought at the expense of action and theory over practice, psychology has too frequently ensconced itself in the ivory tower from which pedants descended upon occasion to proffer pearls of wisdom, objectivity, and logical consistency to their charges without too much concern about the nutritional adequacy of such a diet. The point may be illustrated by the following quotation from Chapman and Counts (**1**):

> Greeting his pupils, the master asked: "What would you learn of me?" and the reply came:
> How shall we care for our bodies?
> How shall we rear our children?

How shall we work together?
How shall we live with our fellowmen?
How shall we play?
For what end shall we live?

And the teacher pondered these words, and sorrow was in his heart, for his own learning touched not these things.

The so far unstated premises of this paper while perhaps implicit in the preceding deserve explicit statement. They are:

1. Psychology in common with all science must have as its fundamental aim the service of society by positive contributions to the good life. The good life is here defined as the homeostatis of society—to use Cannon's phrase—i.e., the optimum stabilizing internal relationships in the dynamic system that we call society.
2. The democratic way of life socially is the best means of achieving the good life individually.
3. Science and scientific methods applied to human problems will be freest to achieve their purposes in the matrix of a democratic way of life.
4. Psychology as one of the sciences has already made substantial contributions to science and can and will in the future greatly accelerate in both quality and quantity its scientific contributions.
5. The life and vigor of any science and especially psychology is directly dependent upon the extent to which it grows out of human problems. The nineteenth century ideal of knowledge for knowledge's sake is at best a by-product, an esthetic luxury.

For purposes of convenience in discussion let us consider first the undergraduate offerings in psychology and then the graduate offerings—although to be sure there is bound to be not a little overlapping.

It is not my purpose to provide yet another blueprint for the introductory course in psychology. There have been several committee reports on this topic and it may safely be predicted that there will be further such reports. In the meantime it should be noted that the content of the first course and what the "consumers" say they expect and would like to have in the course are probably more impressive for their absence of overlap than their close similarity. A sound psychology of learning ought to find its best application in the introductory course in psychology. More "scientific psychology" might in the long run be learned and a better attitude created toward not only the introductory course, but also subsequent psychology courses if the introductory courses with which I have any familiarity were more respectful of the students' "readiness" than they now are.

This need not mean merely "giving the customer what he wants." It does mean capitalizing maximally upon available motivation. This motivation in general is aptly described as wanting the answers to the questions which the pupils asked the schoolmaster: How to care for their bodies, rear children, work and live together, play, and to learn the ends to be lived for. A proper functional respect for the scientific method, presumably one of the aims of any introductory course, will more surely flow out of such consideration than "cookbook" laboratory exercises with nonsense syllables.

In general, the undergraduate offerings must, first, enable the individual to assess himself and his place in society (i.e., lay sound scientific ground for self-guidance) and, second, must be more effectively geared to the activities of the world, particularly through contributing more effectively to the service professions such as teaching, nursing, social work, the ministry, medicine, law and the like as well as to business and industry.

We have not yet changed very much the prejudices, ignorances and superstitions of the typical schoolteacher from those that were prevalent more than two decades ago among the then teachers concerning the relative seriousness of various behavior symptoms in children when the criterion is the judgment of child psychologists (8), and this in spite of the emphasis in the clinical literature and in popular books and magazines on the importance, principles, and practices of mental hygiene.

Psychology's potential contribution to and its responsibility for teacher preparation needs no extended argument. The kind of citizen we shall have tomorrow is largely a function of the education of today. In the most real sense possible we are collectively paying in blood, sweat, tears and unimaginable material costs for the miseducation of fanatical devotees of fascism.

Social psychology at the undergraduate level must concern itself not only with our own social psychological problems but must borrow generously from the field of cultural anthropology and literature to give the undergraduate more nearly valid images of the peoples among whom he lives in an ever-shrinking world.

By way of giving it the status that its importance and achievements as a science warrant I suggest that active efforts be made to have psychology placed on a par with the other sciences in satisfying the science requirements for graduation in the liberal arts colleges and schools of science. This status has already been accorded it, I am pleased to report, at Purdue University.

Psychology must also ally itself more actively with departments and agencies that play an important part in culture control—such as journalism, radio, and in the near future, television, to the end that the "social lag" between science and its technological consequences may be kept at a minimum.

With respect to graduate study and research it will be possible only to state a few principles for frame of reference and to enumerate with a few illustrations some of the major areas in which research is greatly needed and promising of generous returns for the time, energy and thought invested. In general, psychology has in the past been largely oriented in the study of the individual to *homo sapiens* as a biological organism, leaving out of account too often the social conditioning that the organism represents. Research must increasingly enlist the cooperation of the various social and other disciplines such as psychiatry, education, anthropology, economics, sociology and history, both as curricular background for graduate students and in the solution of research problems. We must not love biology less, but the social sciences more. The trend for more adequate quantification during the past two or three decades must and will be continued and strengthened. For example, we very much need a more convenient and less prohibitively laborious mathematical tool for determining the best items in a pool of items for a given measuring instrument than is afforded by our present theoretically best tools such as factor analysis (considering each item a variable) and Horst's method of successive residuals.

In the world of work, the techniques of *job analysis* applied to the tens of thousands of jobs to be done in our technological society are, it would seem, a necessary prerequisite to effective selection and placement of personnel. Too much time has, in my judgment, been spent in obtaining the dimensions of individuals out of reference to and without adequate knowledge of the jobs to be done. This may be in part responsible for a curious type of folklore in industrial management relative to psychology, education and industry vis-a-vis each other. Industrial management is indifferent to or does not like the term "industrial psychologist." Its affective tone toward such terms as "personnel director," "education," and "training" are much more favorable (2). Here and there there is evidence that this attitude toward psychology may be undergoing some change. It constitutes a psychological problem, however, which psychologists will ignore at the cost at least of not being maximally useful in our society.

Along with job analysis a major area for psychological research is job evaluation, a problem with explosive potentialities. The relative "worth" of a job in terms of the financial balance sheet of a particular plant or industrial organization is one thing and its evaluation in terms of status and the human budget is quite another. It requires no extended research to become aware of the fact that the two are by no means perfectly correlated. The homeostasis of society requires more precise knowledge concerning the relationship in order that emotional tensions concerning the problem may be optimally reduced.

With job evaluation and specifications in hand it will then and only then be possible to carry out effectively selection and placement of personnel in terms of the measured dimensions, psychological and otherwise, of the personnel to be selected, placed and/or trained.

The taking over recently of a considerable number of coal mines by the government because of a strike of supervisory personnel poses a major psychological problem which can conveniently serve as an illustration by way of pointing up what is currently the most crucial and inclusive problem of industry—variously labelled as industrial or labor relations or, preferably for my present audience, the problem of "morale." Since the publication about a dozen years ago of Elton Mayo's important book (6), some progress has been made both scientifically and politically in the realistic facing of this pervasive problem, but no one at all familiar with the situation is fatuous enough to believe that we have done more than to make a promising beginning.

I choose the strike of supervisors in the coal mines as an example both in relation to the problem of industrial relations and to illustrate by means of a recently completed study under my direction by Doctor Quentin File an approach to the problem of selection and placement as well as training of supervisors (4). The study is chiefly concerned with measuring the insight and understanding of supervisors relative to what may be broadly called the human or mental hygiene aspects of the supervisor's job. The measuring instrument consisted of 204 items obtained from the literature on mental hygiene, supervision and management relating to supervisor's practices, attitudes, and company policy to which something over a thousand supervisors responded in eleven different industries differing widely in size, geographical location and product manufactured. Responses were in terms of a five point agreement-disagreement *a priori* scale. "Right" answers were determined by the consensus of judgment of some 45 experts in mental hygiene, industrial psychology and personnel management. These experts, incidentally agreed with each other remarkably well—$r = .91$. Each supervisor was also rated by at least four persons in management above him on a graphic rating scale designed for the investigation. Item correlations against this criterion and also against the criterion of the total score were then made and non-valid items discarded. In passing I may note that in my judgment a more significant criterion would be ratings by workers under the supervisors. This, however, was "too hot to handle" in the judgment of all the industries except one with which we had contact. The study revealed an interesting pattern of attitudes among the "best" supervisors as rated by management. On attitudes and practices related to straight-forward skills or knowledge learning or training situations they were on the whole gratifyingly psychologically sound. Wherever the issue of the hierarchy of industrial power and responsibility, however, was either explicitly or implicitly raised in an item, its correlation with the ratings tended to be positive, but its correlation with the criterion of expert judgment tended to be negative. Here is an issue worthy of the best efforts at solution of all those concerned.

Psychological service to management is already to some extent established and bids fair to flourish greatly in the period immediately in the future. The possible uses of such a measuring instrument as just described in the selection, placement and training of supervisory personnel need no elaboration nor is it difficult to see its uses in the evaluation of the extensive training programs for foremen and supervisors at present being carried on largely without benefit of such an evaluation device.

Psychological service to labor has, I believe, equally potent and as yet almost entirely unexplored possibilities. I need only mention such items as the possibility of consulting service, of opinion polling, of training shop stewards, organizers, and labor leaders in general for responsible functioning to make this suggestion a perfectly obvious one.

Psychological service to both management and labor through attacking the problems of motivation and factors affecting it—factors ranging all the way from the minutiae of the working place in the shop to such complexities as the form of government and its regulatory functions—are possibilities to challenge any psychologist who believes in his profession. A note or two on governmental functioning as affecting industrial production may be in point. There is evidence (3) to show that during the "popular front" government under Leon Blum in France industrial production per man-hour unit increased perceptibly. An interesting survey (9) made about ten years ago shows that the politico-economic organization of a nation not only determines psychological theory as applied to industry, but also the very psychological facts themselves. To quote: ". . . a science is defined by its problems as well as its techniques and Soviet psychologists have seen their problem transformed. . . . They traced the inadequacies in their work through a mistaken reliance on a theory and a methodology developed under a profit-economy. . . . The Soviet psychologist sees himself as set before new problems. These are to be successfully attacked only with a theory which lays chief stress on the power of social influences to mould personalities in order to create new possibilities in human performance." These psychologists apparently do not believe that human nature exists in a vacuum or that it is rigidly determined by the individual's genetic constitution, but that the social environment moulds the personality. Here is an hypothesis the adequate testing of which offers more than sufficient challenge to even the most ambitious of psychological scientists.

To return to our own type of economic structure in the area of business psychology, "consumer" and "market" research deserve mention as a relatively new and important venture that is doubtless destined to tremendous growth and extension. Its analogue in the attitude studies of the U. S. Department of Agriculture under Likert, those of Stauffer in the armed forces and the studies of consumer needs and preferences in the WPB are obviously psychological in purpose and methodology and are capable of almost indefinite extension in a democracy. Public opinion surveys have a high potential of usefulness not only in business but in government and education as well. I shall revert to this topic presently under another heading.

I should like to introduce my remarks concerning the general area of social psychology by a quotation from a recent *Newsletter* of the Society for the Psychological Study of Social Issues (**13**).

What Are the Answers?

The following letter was written by a cowboy in Montana to a Department of Psychology in an Eastern university. It is reproduced here because (1) it helps to define the field of "the psychological study of social issues," and (2) it reveals in a nutshell why thoughtful psychologists have an inferiority complex. If you haven't one, just try answering these questions.

Dear Sirs:

Would you please recommend a few authoritative but not too technical books on psychology dealing with the following questions?

What should a person who is not race prejudiced or nationalistic understand about the nature of those who are?

Why do people get angry easier when discussing religion, atheism, evolution, and politics?

Why are many Christians anti-Semitic, anti-evolution, and anti-negro?

What is religion?

What is the personal value of praying?

If you believed that evolution is a fact in nature, what should you want to know about the nature of a Christian who is prejudiced against evolution, in order to argue it skilfully?

Would atheism destroy civilization?

What is the psychological cause of war?

Why don't we talk freely about sex?

Would free love destroy civilization?

What is human nature?

How does it differ from animal nature?

How do psychologists classify personalities?

How does feminine psychology differ from that of men?

Why wasn't woman-suffrage a natural primitive way of life?

Is human nature such, that if Nazism wins, would it become humane and more scientific on race, as it comes of age, as Christianity has?

What should a bashful and self-conscious person know about social adjustment and maladjustment?

What should I know about the moods, dispositions, temperaments, and emotions of other people in order to get along with them?

These are perhaps too many questions to ask anyone, but I think some of them are different ways of looking at the same question. I wish to thank you for whatever books you may recommend.

Yours sincerely

The ratio of what we know about the answers to these thoughtful questions of a cowboy to what we do not know is obviously in the nature of a very small fraction. Some of the questions, to be sure, are probably not amenable to scientific exploration. For others we already have reasonably adequate answers. But on the whole too many of our problems are being solved on the basis of folklore without benefit of very much in the way of scientific analysis.

Social psychology is obviously not a neatly isolated category as distinguished from other categories such as clinical, educational or industrial psychology except in college catalog descriptions. In reality it cuts across all other categories of this sort in the sense that the social *milieu* is an important variable affecting individual behavior. In the paper by Schultz and McFarland (**9**), for example, the fact is brought out that the functional psychoses in Russia are not comparable to those in our country: "Cases of 'exhaustion' and neuraesthenia have increased while other types of nervous disorders related to economic or group insecurity and religious or sexual 'guilt' have supposedly decreased." Is this bit of evidence social psychology or abnormal psychology? The answer is obviously "yes—both."

The research problems in the general area of social psychology involve such things as the study of cultural and economic variables in addition to any other variables related to the objects of study.

One of the areas usually classed here—public opinion—has already been mentioned in passing in connection with industrial psychology. I have elsewhere (**7**) outlined a proposed program of research with secondary school youth. Much significant work is being done in public opinion research by many agencies and individuals. Names like Gallup, Cantril, Lazarsfeld, Likert, Stauffer, and many others come readily to mind in this connection.

Problems of growth and change of attitudes are of major theoretical and practical concern and will doubtless have increasing attention. They pay dividends in business and are crucial in the homeostasis of society. We have here the beginning of the science of values which, I predict, will be rapidly extended. It may very well become the stone which the builders rejected with an importance similar to that attributed to its scriptural analogue.

One of the most useful problems to attack in abnormal psychology seems to me to be a research program designed to validate scientifically and objectively those concepts of psychoanalytic derivation that are amenable to such an approach. The impact of psychoanalytic theory upon art, literature, medicine, child care, social service, criminology, penology and religion is doubtless greater in practice than all other psychological science combined. An excellent survey of the psychological literature bearing on the problem has recently been published (**10**). The difficulty with most of these studies is that they only incidentally turned up data bearing more or less on the validity of psychoanalytic concepts, since they were not designed specifically with that end in view. What is required is to take these concepts out of the theoretical framework of psychoanalysis and to test their validity wherever possible in the theoretical frame of nonpsychoanalytic techniques thus leading to an objective, behavioral understanding of personality. The problem is worthy of extended effort. Here the bare mention of it must suffice.

In view of the fact that we are a rapidly aging nation in the sense of having a growing proportion of our population in the higher age groups one of our important problems is the development of the science of gerontology. Previous to the war an individual over 40 years of age often found it difficult to get employment. The compulsory age of retirement of university and other teachers probably has little to recommend it except ease and convenience of administration. Moreover, the emotional adjustments required to be made appear often not possible for the individual to make at all successfully. How to grow old gracefully and mayhap youthfully needs scientific attention of psychologists and others.

The most potent and crucial of society's organized activities for maintaining and facilitating its own homeostasis is that of education. Educational psychology is, by the same token, the most important branch of applied psychology. Again this category is ill-defined. If by educational psychology we mean the study of how behavior is modified, then obviously there is little in psychology that does not belong in this rubric. Even animal psychology qualifies. My own present purposes of definitions are served by a flash-back to the questions put to the schoolmaster by his pupils—the psychology of learning how to care for one's body, how to rear children, how to live together, how to work, how to play and the ends to be lived for can define the field.

An immediate task in which psychologists should prominently share is the demobilization of the armed forces and industrial personnel and helping them adjust to their new roles. Even reasonably adequately trained personnel is not available in sufficient numbers, and the skill with which this training is done in the shortest possible time will largely determine the effectiveness with which the readjustment from war to peace will be made. It is to be hoped that the Army will make available for this task of guidance the men trained in the Personnel Psychology curriculum of the Army Specialized Training Program.

The tasks of peace will only in part be the old familiar ones. These will in many respects have undergone changes—some of them revolutionary—that set new problems for the psychologist. How educate the oncoming generations of all colors of skin or religious beliefs so that they will more intelligently tackle the job of learning how to live together in peace for constructive ends? If we fail to learn how to adapt to each other, the white minority in the world may presently find itself written off as an interesting but abortive experiment in biological and social evolution. The colored majority, having acquired our technology, may decide to dispose of us.

How rear children? "Problem children" generally speaking are the result of "problem parents," "problem neighborhoods," "problem educators," and "problem social institutions." The University of Iowa has recently announced a significant new venture in graduate training (11) that should make a constructive contribution in this area. It will train students not only in child welfare but also and at the same time in journalism and radio so that they may make this training maximally effective in "culture control."

That there is considerable lag between our best knowledge and even college students' possession of it is illustrated in another doctoral dissertation recently completed by one of my students (5). This study was designed to get at the insight and understanding of students concerning the mental hygiene of college and university learning and teaching with an instrument similar in mechanical design to the one already mentioned relating to industrial supervision—five-response items the "best" answers to which were the consensus of ten experts. Following are the percentages of 326 men and 1056 women students in eight different colleges and universities with the judgments of the experts on best answers for a few illustrative items. On the arbitrary scale, 1 indicated strong disagreement, 5 strong agreement and the others in between.

	Experts "best" answer	*Per cent agreement with experts* Men	Women
If a person is willing to work hard, he can succeed in any type of work.	1	15	11
The content of a college course should be adapted to the average mental ability of the students enrolled.	4	13	10
The student who worries excessively should be told just to forget about it, and everything will be all right.	1	8	7
The greatest danger of emotional outbursts is that of inducing similar reactions in other people.	1	9	12
Students outgrow their early emotional experiences, as they do shoes and other clothing.	1	11	17
If an instructor keeps class conditions the same and gives all the students an equal opportunity to respond, he has done all he can be expected to do.	1	16	19
Colleges cannot adapt themselves to individual students without shirking their responsibility to society as a whole.	1	14	20

	Experts "best" answer	*Per cent agreement with experts*	
		Men	Women
As a rule, rapid learners are quick forgetters.	1	19	21
The same normal person may be quite honest in one situation and dishonest in another similar situation.	5	8	11
It is normal for a girl to be "upset" and "moody" at time of menstruation.	2	11	36
Sarcasm is at times a useful and healthful weapon for instructors to use.	1	16	26
The thing most necessary for academic success in college is the ability to concentrate.	2	6	7
"Feeling of guilt" is often not in proportion to the wrong that a person has committed.	5	11	13
Really adult, well-balanced persons conceal all show of emotion.	1	16	20
College students should be proud of being homesick for several months after they enter college away from home.	1	11	19
A person should not admit to himself that others are more intelligent than he is.	1	15	21
It is unusual for a person to be jealous of a brother or sister.	1	15	15
It is desirable to recognize that in certain abilities one is inferior to other people.	5	15	13
Any type of overwork (even as much as eighty-four hours per week) in and of itself would never be the cause of a "mental break-down."	5	4	5
The attitude one takes toward one's abilities and emotions is much more important for mental health than the abilities and emotions in and of themselves.	5	6	12
"Common sense" on the part of the instructor or counselor is adequate for handling most difficulties of college students.	1–2	22	22

If time permitted it would obviously be easy to continue the listing of problems in the scientific solution of which the psychologist would have an important share. But time does not permit. Enough has been said to indicate some of the areas in which we can profitably apply our talents and methods. The need in graduate study to break down the walls between academic departments in the solution of problems that matter has, I trust, been sufficiently clearly indicated.

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PROCEEDINGS OF THE FIFTY-SECOND ANNUAL MEETING OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION, INC., CLEVELAND, OHIO SEPTEMBER 11 AND 12, 1944

Report of the Secretary, Willard C. Olson, University of Michigan

The outstanding event of the Fifty-second Annual Meeting was the unanimous adoption by the Business Meeting of the American Psychological Association of a new set of By-Laws to become effective at the next Annual Meeting. The new By-Laws are designed to permit the Association to become representative of all interests in American psychology. The adoption was preceded by unanimous adoption of enabling legislation at the Business Meeting of the American Association for Applied Psychology. The action of the Association was a culmination of recommendations prepared at the Intersociety Constitutional Convention held in New York City in May, 1943. The details of the proposals and actions taken may be found later in these Proceedings.

The Fifty-second Annual Meeting was the third to be held with the modifications necessitated by the conditions of war. The elaborate Fiftieth Anniversary Celebration scheduled for Boston for 1942 was cancelled in response to a request from the Office of Defense Transportation and a "skeleton" meeting held at New York City instead. The skeleton meeting planned for Chicago for 1943 was moved to Evanston and reduced to *token* proportions for the transaction of essential business. The Council was empowered to make the arrangements for the 1944 meeting. When it became apparent that the American Association for the Advancement of Science was to meet in Cleveland, it was decided that the APA should hold a joint meeting with the AAAS. In view of the restrictions on travel it was decided not to issue the usual call for papers but to arrange for special sessions on war and post-war problems and for the transaction of essential business. A Program was developed jointly with Section I (Psychology) of the AAAS and the AAAP. The tentative program was printed in the July, 1944 *Psychological Bulletin* and later appeared in the General Program of the AAAS. The Program as presented is incorporated later in the Proceedings.

A notice of meeting was also included on the ballot on the proposed new By-Laws and sent by first class mail to the last recorded address of all Members and Associates in July, 1944.

The regular Business Meeting of the AAAP was held on Tuesday afternoon just preceding the Business Meeting of the APA and an adjourned session was held immediately following to implement the actions of reorganization. Professor Carl Rogers of Ohio State University is the new President.

The Psychometric Society held a session for the discussion of business on Monday afternoon. Harold O. Gulliksen of the University of Chicago is the new President. Paul Horst of Proctor and Gamble and L. L. Thurstone of the University of Chicago are the new members of Council. Other officers were continued.

A meeting of the Committee for Section I (Psychology) was held on Monday evening. New officers are to be announced later through the AAAS.

The total of 245 persons registered included 97 Members, 99 Associates, 6 newly transferred Members, 2 newly elected Associates and 41 non-members. This was the largest meeting since the 1941 meeting at Northwestern University when 1218 persons registered. One hundred and fifty persons registered at the skeleton meeting in New York City in 1942 and 70 persons at the token meeting at Northwestern University in 1943.

Although the meeting was small in terms of peace time standards, there was a wide geographic representation as shown by the following analysis of the home addresses:

Arkansas 1; California 1; China 1; Colorado 1; Connecticut 6; District of Columbia 10; Florida 1; Georgia 1; Illinois 27; Indiana 4; Iowa 5; Kansas 3; Kentucky 5; Massachusetts 10; Michigan 13; Minnesota 6; Missouri 5; Nebraska 2; New Jersey 6; New York 31; North Carolina 1; Ohio 78; Pennsylvania 14; Rhode Island 1; Texas 1; Vermont 1; Virginia 5; Washington 1; West Virginia 1; Wisconsin 2; Wyoming 1.

TRANSACTIONS OF THE ANNUAL BUSINESS MEETING

The Annual Business Meeting of the American Psychological Association, Incorporated, was held on Tuesday, Sept. 12, 1944 in the Pine Room of the Hotel Statler, Cleveland, Ohio. The meeting was called to order at 2:40 p. m. by the President, Gardner Murphy.

Upon motion by the Secretary, seconded from the floor, it was voted that the minutes of the Fifty-first Annual Meeting, held at Northwestern University, be approved as printed in the November, 1943 issue of the *Psychological Bulletin.*

Information concerning the death of eight Members and thirteen Associates had been received since the last Annual Meeting. As a memorial the audience stood in silence as the Secretary read their names:

Members: J. McKeen Cattell, Jan. 20, 1944; Gilbert V. Hamilton, Dec. 16, 1943; Joseph Jastrow, Jan. 8, 1944; Lillien Martin, Mar. 26, 1943; Walter T. Marvin, May 26, 1944; Eleanor R. Wembridge, Feb. 20, 1944; Max Wertheimer, Oct. 12, 1943; Giles M. Ruch, Nov. 15, 1943.

Associates: Bertha M. Boody, Aug. 21, 1943; Moshe Brill, Dec. 4, 1943;

V. V. Caldwell, Nov. 4, 1943; Mary C. Carpenter, May 25, 1942; Sidney A. Cook, Feb. 4, 1944; Solomon D. Evans, Jan. 7, 1944; Virginia VanDyne Fleming, May 5, 1943; Frazer Hood, June 19, 1944; Edwin J. Kunst, June 19, 1943; Moritz Lowi, Jan. 5, 1944; Marion Mattson, Nov. 1, 1943; Josephine Smith, May 5, 1944; Arnold Thomsen, Apr. 13, 1943.

The Secretary announced the resignation of the following five Members:

Max Freyd, I. Krechevsky, H. C. Sanborn, Laura Toops, and Louis W. Webb.

The Secretary announced the resignation of the following 65 Associates:

Abbate, Raymond V. P.
Aldrich, Margaret Glockler
Allen, Helen McCreery
Ascham, John B.
Ball, Rachel Stutsman
Baxter, Edna Dorothy
Beebe, Elinor Lee
Bernhardt, Ruth L.
Bonniwell, Bernard L.
Caldwell, John L.
Carlson, Grace Holmes
Carter, Dorrice S.
Corliss, Myrtle Elizabeth
Crook, G. Hamilton
Cohen, Anna
Crudden, Charles
DeBow, Jeanne G.
Deisenroth, Carl E.
Douglass, Carl R.
Elmendorf, Laura Gundlach
Embree, Royal B., Jr.
Falk, Rita J.
Flannery, Jane
Freeman, Ellis
Gardner, Iva Cox
Gezon, Elizabeth
Gray, Wendell L.
Hall, O. Milton
Harte, Alice Taylor (Mrs. Joseph)
Holcomb, V. Louise
Hoppock, Robert
Jameson, Augusta
Johnson, Eleanor Hope
Kling, Maybelle M.
Kuznets, George
Lee, Doris May
Leinbach, Mary Emma
Libby, J. E. P.
Lumpkin, R. C.
Lund, Max W.
Maslow, Albert P.
Mayo, Elton
Meranze, David R.
Mintz, Alexander
Moore, Roland C.
Mundel, Luella M. Raab
Myers, C. Roger
Parker, M. M.
Patton, Robert A.
Phillips, Milton L.
Pratt, J. G.
Redmond, Silvie
Remmlein, Madaline Kinter
Schaefer, Vernon G.
Seeleman, Virginia Miles
Shapiro, Lillian F.
Sharkey, Vincent J.
Sheperd, Jane Alben
Sperling, Elizabeth B. (Mrs. M. H.)
Stackman, H. A., Jr.
Stippich, Mary Elizabeth
Washco, Alec, Jr.
Webster, Edward C.
White, Goodrich Cook
Williams, David C.

The Secretary announced that the following persons, elected as Associates in 1943, did not qualify because of failure to pay dues by reason of military inaccessibility or for other reasons:

J. W. Bowles, Jr., Benjamin Brody, Sibylle Escalona, Ignacio B. Matte, Harry B. Silver, and Arthur L. Strang.

Mr. Bowles and Mr. Matte, at their request, have been recommended for reelection at this meeting.

The Secretary announced that the following Members have applied for and received the status of Life Members:

Gardner C. Basset, Sarah Ritter Brown, William L. Bryan, Samuel B. Heckman, E. C. Rowe, and Lightner Witmer.

The Secretary announced that the Council of Directors has approved the actions of President Gardner Murphy in making the following appointments:

Lt. Colonel J. C. Flanagan of Washington, D. C. and Dr. Herbert Wright of Catholic University at Washington as delegates to the inauguration of Patrick J. McCormick as Rector of the Catholic University of America on Nov. 9, 1943.

Dr. George J. Dudycha of Ripon College, Ripon, Wisconsin to act as representative to the inauguration of Clark George Kuebler as seventh President of Ripon College on Dec. 7, 1943.

Miss Mary Hale of Bryn Mawr College, Francis W. Irwin of the University of Pennsylvania, and James D. Page of Temple University, Philadelphia, as delegates to the Forty-Eighth Annual Meeting of the American Academy of Political and Social Science on Apr. 14 and 15, 1944 at Philadelphia, Pennsylvania.

Arthur W. Kornhauser as representative to the second National Wartime Conference of Scientific and Professional Workers held at New York City on June 2 and 3, 1944.

The Secretary announced the following interim actions of Council and other activities of interest to the Association:

The eighth joint meeting of the Council of Directors and Board of Editors was held on Sunday, Sept. 10, 1944 at which time reports on editorial and business policies were discussed.

A report from Harold Schlosberg, who has been editing the Psychology News Letter for the Office of War Information, was presented at the joint meeting of Council and Editors. The report will be printed in the Psychology and the War section of an early issue of the *Psychological Bulletin.*

The Council of Directors has prepared the following statement as a result of a discussion of channels of publication: The Council of Directors of the American Psychological Association calls the attention of psychologists to the importance of the media chosen for the publication of articles and studies of interest to the profession. Many university press publications and university series are distributed only to a few hundred libraries and seldom reach all professional psychologists. These publications often escape indexing and abstracting and are lost to the history of psychology. On the other hand, the Journals and Monographs of the Association place material directly in the hands of thousands of professional psychologists.

The Board of Editors has elected H. S. Langfeld as Acting Chairman to serve in place of Walter S. Hunter, Chairman, who desired relief in order to devote his time to the Applied Psychology Panel of the Office of Scientific Research and Development.

Walter S. Hunter was reelected as Editor of the Psychological Abstracts by the Electoral Board for the term beginning Jan. 1, 1946.

Council on Feb. 8, 1944 voted an appropriation of $400.00 to cover railroad fare and pullman for attendance of the Board of Editors and Business Manager of Publications at a meeting at a time other than that of the Annual Meeting.

On Mar. 9, 1944 Council voted to offer special rates for its publications to all men and women in uniform not now members of the Association. The following rates were established: Offer no 1, *Psychological Bulletin*—$1.50; Offer no. 2, *Psychological Abstracts*—$4.00; Offer no. 3, *Abstracts and Bulletin*—$5.50;

Offer no. 4, *Journal of Abnormal and Social Psychology, Journal of Applied Psychology, Journal of Experimental Psychology, Psychological Review, Psychological Monographs*—$10.00.

The Secretary attended a meeting of Secretaries of organizations affiliated with the AAAS at the Palmer House on Oct. 2, 1943. The meeting was called by the AAAS for a discussion of future policies and plans.

The Secretary attended a meeting of the Social Science Research Council in New York City on Apr. 1 and 2, 1944. The invitation came as a part of the policy of the SSRC of acquainting cooperating societies more fully with the work of the Council.

On Feb. 15, 1944 Council voted in favor of applying for Membership in the National Council on Rehabilitation and made an appropriation of $25.00 for dues for 1944. The application was approved and subsequently Dr. Louis Long was appointed as temporary representative of the APA at the physical meeting of the NCR in New York City on June 5 and 6, 1944.

By vote of Council the Secretary circulated materials to all Associates of five or more years standing calling attention to the requirements for transfer. With the approval of Council, the Secretary also sent 800 sets of materials on Associateship to a list of non-affiliated registrants of the Office of Psychological Personnel supplied by Donald Marquis.

At the request of Clarence Carpenter, Chairman, Council on May 18, 1944, approved unanimously the addition of Mark A. May to the Association's Committee on Audio-Visual Aids.

The following declaration of emergency was adopted by Council on Feb. 11, 1944:

> WHEREAS the AAAS recently has announced a general meeting in Cleveland for Sept. 11 to 16, 1944, and WHEREAS numerous advantages in transportation, accommodations, and in probable attendance accrue from a joint meeting, BE IT RESOLVED that the Council of Directors declare the existence of an emergency as described in Article III, Section 4 of the Constitution, and hereby exercises its interim powers to change the date of the meeting from the week beginning Sept. 3, 1944 to the week beginning Sept. 10, 1944, PROVIDING that details for a joint meeting with AAAS are worked out successfully.

A letter has been received from Herbert S. Conrad inviting psychologists to attend a meeting of the Biometrics Section of the American Statistical Association on Wednesday morning, Sept. 13, in the Pine Room. The meeting is concerned with "Statistical Methods in Current Economic-Psychological Problems."

Calvin Stone, in the absence of John E. Anderson, Chairman of the Election Committee, announced the election of the following officers and representatives by mail ballot:

President for 1944–1945: Edwin R. Guthrie, University of Washington

Council of Directors for 1944–1947: Edwin R. Guthrie, University of Washington, and Carl R. Rogers, Ohio State University

Nominees for Representatives to the Division of Anthropology and Psychology of the National Research Council: Robert R. Sears and Kenneth W. Spence of the State University of Iowa and Otto Klineberg, Columbia University

Representatives on the Social Science Research Council: Robert R. Sears, State University of Iowa

The duplication in the election of Edwin R. Guthrie to both the Presidency and to Council was noted. Dr. Guthrie had previously indicated his wish to withdraw from Council to serve as President. Accordingly, on recommendation of Council, The Association unanimously voted to name Dael Wolfle, University of Chicago, as a member of the Council of Directors for the period 1944–1947.

One hundred and twenty-five Associates, Members, and visitors were present in the room for the Annual Meeting. To be certain that a quorum was present President Murphy asked all Members to rise to be counted. The Secretary and Treasurer counted 71 Members. Since the Constitutional requirement is but 50, the President declared a quorum to be present, and proceeded with the items on the mimeographed agenda.

The Association voted to elect Oscar D. Anderson and Glen Finch directly as Members.

The Association voted to transfer the 49 Associates named below to the status of Members:

Alexander, Francis S.
Andrews, Tom G.
Baier, Donald E.
Blair, Glenn M.
Burnham, Robert W.
Cartwright, Dorwin
Clark, Weston R.
Cofer, Charles N.
Cole, Lawrence E.
Cook, Edgar M.
Coombs, Clyde H.
Erickson, Ralph W.
Festinger, Leon
Frandsen, Arden N.
Frenkel-Brunswik, Else
Gilbert, Gustav M.
Gregory, Wilbur S.
Hanawalt, Nelson G.
Harris, John D.
Henderson, Mack T.
Henry, Edwin R.
Hermans, Thomas G.
Jones, F. Nowell
Key, Cora B.
Kuhlen, Raymond G.
Lawshe, Charles H., Jr.
Leitch, Andrew
Lerner, Eugene
Lewis, Helen B.
Little, James K.
Mote, Frederick A., Jr.
Neet, Claude C.
Newburger, Maurice
Peixotto, Helen E.
Perry, Winona M.
Roe, Anne
Sanford, Robert N.
Sisk, Henry L.
Slawson, John
Thompson, Claude E.
Thorne, Frederick C.
Tilton, John W.
Tucker, Anthony C.
Weaver, Homer E.
Wickert, Frederick
Wilkins, Walter L.
Williams, Stanley B.
Youtz, Richard P.
Zeigler, Thornton W.

The Association next turned to a consideration of the list of 473 applicants for Associateship. One group of applicants involved various combinations of graduate study, work in the Personnel Training Program of the Army Specialized Training Program and work under supervision in the various army psychological research centers. The Secretary read their names and explained that the Council recommended their election on the assumption that they have had the substantial equivalent of the year of graduate work demanded by the Constitution. Other permissive variations were also explained. There being no objection to the recommendations, the Association voted to elect as Associates the 473 persons whose names appear below:

Abelman, Ruth H.
Abramson, Leonard S.
Adams, Joe Kennedy
Adolphson, Gudrun
Albert, Kathryn E.
Albrecht, Ruth E.
Ames, Violet C.
Anderson, Frances J.
Appleby, Mary Ellen
Ashby, Margaret B.
Ashton, Philip F.
Atkins, Grace F.
Averill, Richard L.
Babitch, Diana
Bagby, James W., Jr.
Bailey, Richard J.
Baker, Corinne F.
Ball, Georgiana E.
Bardsley, Roger E.
Bassell, Jack S.
Bath, John A.
Bauman, Mary K.
Beccaris, Louise T.
Becker, Harry A.
Benedict, Margaret R.
Berenda, Ruth
Bevan, William, Jr.
Bigelow, Mary M.
Blau, Helen B.
Blodgett, Harriet E.
Blodgett, Hugh C.
Bobbitt, Ruth A.
Bolanovich, Daniel J.
Booth, Herbert J.
Bowles, J. W., Jr.
Bowman, Margaret E.
Boyer, Carl W.
Bray, Douglas W.
Bray, Olive K.
Bressler, Mary H.
Bridges, Afton C.
Brines, Moses J.
Broadhurst, Betty L.
Brown, Virginia M.
Bryant, Hilda G.
Buchan, Dorothy W.
Buller, Francis P.
Burke, Henry R.
Cambreleng, Paul L.
Carrington, Dorothy H.
Carter, Virginia M.
Cason, Eloise B.
Cassens, Frank P., Jr.
Castore, George F.
Chafetz, Lenore
Charner, Hilliard D.
Chasin, Joseph B.
Christiansen, Carole
Chute, Eloise
Cieminski, Leo J.
Clark, Grover C.
Collins, DWane R.
Colman, Emanuel M.
Conley, Lloyd B.
Connery, Maurice F.
Cooper, Marcia M.
Costin, Frank
Courtney, Paul D.
Coyne, Jane W.
Creegan, Robert F.
Cross, Orrin H.
Crouch, Roy A.
Cummins, Edith
Cummins, Lester R.
Cynamon, Manuel
Daingerfield, Mary W.
Davidson, Eli E.
Davidson, Marjorie L.
Davis, Catherine W.
Davis, Paul Chafin
Davison, Vida D.
Deane, Stephen R.
de Jersey, Murray G.
De Palma, Nicholas
De Phillips, Frank A.
Deri, Susan K.
Diamond, Jane W.
Dinin, Bessie B.
Dixon, Ruth G.
Dlugacz, Jason
Dorsey, Joseph R.
Driscoll, Gertrude P.
Droste, John L.
Drummond, William A.
Eckstrand, Gordon A.
Edwards, Frances M.
Edwards, William W., Jr.
Egan, Eula P.
Ehrenfreund, David
Ehrenreich, Gerald A.
Eicher, C. Franklin
Eller, Marian
Elliott, Charles R.
Elliott, Norman K.
English, Earl F.
Errett, Wade, Jr.
Evans, Mary E.
Fairbanks, Grant
Faries, Miriam
Fear, Richard A.
Feibelman, Senta
Feldberg, Theodore M.
Fike, Irene A.
File, Quentin W.
Fishman, Sidney
Fisichelli, Vincent R.
Fitzgerald, Don Casot
Fleeson, William H.
Flesch, Rudolf
Floming, Alice M. R.
Fontaine, Jesse T.
Fontneau, Barbara J.
Forbes, Lucius E.
Ford, Fred C.
Fortune, George J.
Fouracre, Maurice H.
Fowler, Fred M.
Fox, Thelma B.
Francis, Margery G.
Franck, Kate
Franklin, Muriel
Freeman, Paul M.
Fruchter, Benjamin
Furman, Martha
Fusfeld, Irving S.
Gambaro, Providence K.
Gamble, Allen O.
Gandler, Ida
Gershenson, Charles P.
Gerstein, Reva A.
Gibby, Robert G.
Glad, Donald O.
Glascor, Edwina T.
Glasson, Roger E.
Gobetz, Wallace
Goen, Muriel
Gold, Leah
Goldberg, Philip L.
Goldman, Alexander
Golightly, Cornelius L.
Goodbar, Suzanne B.
Goodman, Samuel
Gordon, Allan T.
Gordon, Donald A.
Gould, Bernice
Gramlich, Francis W.

Gray, Florence E.
Greene, Paxton
Grimes, John O.
Gregory, Jack W.
Greiff, Frances S.
Grossman, Searles A.
Grey, Virginia
Grier, Daniel J.
Grigg, Austin E.
Grob, Samuel
Guerrero, Rogelio D.
Guerriero, Michael A.
Guze, Henry C.
Hadley, Loren S.
Hadley, Samuel T.
Hagenstein, Ruth H.
Halpern, Florence
Hamilton, Portia
Hanchett, Gertrude A.
Hansen, Frank W.
Harless, Byron B.
Harless, William H.
Harper, A. Edwin
Harper, Robert S.
Harris, Chester W.
Harris, Vera L.
Hastorf, Albert H., III
Hay, Louis
Hays, Mahela W.
Heath, Samuel R.
Heisler, Florence A.
Hendy, Ann Berry
Henninge, Margaret E.
Henry, Arthur G.
Hill, Lillian B.
Hindle, Helen M.
Hinshaw, Robert P.
Hire, A. William
Hofstein, Saul
Hollinshead, Merrill T.
Hooper, Marian J.
Horrocks, John E.
Howe, John W.
Hubbard, Theodora L.
Huddleston, Edith M.
Hughes, Jeanette E.
Hughes, Robert M.
Hunter, Elwood C.
Immergluck, Ludwig
Ismael, Walter W.
Jacobson, Frances E.
Janis, Irving L.
Jaspen, Nathan
Jay, Edith S.
Jensen, Arthur V.
Johnson, Arthur E.
Johnson, George O.
Johnston, Roland E., Jr.
Jones, George Ellis
Jones, Molly Mason
Joy, Stephen J.
Kaitz, Hyman B.
Kalish, Donald
Kao, Catherine Chun Chun
Keislar, Evan R.
Kellaway, Peter E.
Kelly, Edward I.
Kelly, Elizabeth G.
Kemble, Elizabeth L.
Kempf, Edward J.
Kerr, Virginia N.
Kimber, John A. M.
Kimble, Gregory A.
King, Dorothy C.
Klippert, Henry L.
Knapp, Pearl G.
Knauft, Edwin B.
Kramish, Art A.
Kreizkowski, Joseph
Krugman, Dorothy C.
Lachman, Sheldon
Lane, Ruth Ruppin
Lawrence, Marvin J.
Leavitt, Harold J.
Leeds, Carroll H.
Lehndorff, Annemarie
Lerner, Joseph S.
Leshner, Saul S.
Levy, Ruth J.
Lichtenberg, Ann G.
Littman, Richard A.
Long, Herman H.
Long, Howard H.
Lorang, Sister Mary C.
Lotman, Sylvia S.
Lottier, Stuart
Luborsky, Lester B.
Lucas, John J.
Luft, Joseph
Lumry, Gayle K.
McAndrew, Sister M. Bernardina
McClelland, William A.
McCormick, Malcolm Y.
MacDonald, Marjorie C.
MacGahan, John A.
MacGregor, Robert
Mack, Frances W.
McNeill, Mary Agnes
McReynolds, Paul W.
Maddy, Nancy R.
Maisner, Edna
Marcus, Madeline G.
Margolis, Benjamin
Marks, Rose W.
Marquart, Dorothy I.
Martin, John Rogers
Martin, Leslie L.
Matte, Ignacio B.
Matthews, Jack
Merrill, Barbara
Metzner, Norma L.
Meyerson, Lee
Miale, Florence
Miller, Daniel R.
Miller, Frances C.
Mintz, Samuel S.
Mitchell, Claude
Mitchell, Richard T.
Molloy, Regina M.
Montalto, Fannie D.
Morgan, Sarah S.
Moriarty, Alice M.
Morris, Sally A.
Morson, Meyer
Mullen, Esther M.
Myers, Louise K.
Nance, Roy D.
Nassar, Carlos
Natti, Lora P.
Nelson, Abram G.
Neu, Ruth W.
Neuman, Gerard G.
Nikolaisen, Katherine A.
Nicholas, William T.
Noer, Mary C.
Nolan, Esther G.
Northrup, Catherine M.
Northway, Mary L.
Novis, Frederick W.
Ochs, Eleanore
Offenbach, Harry M.
Olson, Edna L.
O'Neill, Philip H.
Oppenheim, Sadie
Otten, Kenneth H.
Owens, Marjorie L.
Pane, Frank
Panush, Sid H.

Parnicky, Joseph J.
Patten, Barbara D.
Patton, Robert A.
Peatman, Lillie B.
Peck, Joyzelle M.
Pelz, Donald C.
Penningroth, Paul W.
Phares, Mary L.
Phillips, Howard G.
Pintler, Margaret H.
Poinc, Arthur E.
Postman, Leo J.
Potter, Elmer H.
Platt, Eleanor B.
Platt, Henry
Preston, Catherine J.
Prose, Sister M. Redempta
Prybylski, Lawrence, Jr.
Queen, Evangeline P.
Ramsey, Glenn V.
Rauch, David
Raush, Harold L.
Ray, Joseph J.
Rehm, Linda E.
Reid, Lyne S.
Reigart, Agnes H.
Reik, Theodore
Renshaw, Morton J.
Reyna, Leo Jay
Rickards, Elsie S.
Riecken, Henry W., Jr.
Rieger, Audrey F.
Roads, Marjorie J.
Robbina, Irving
Robinson, Alexander J.
Rochlin, Isaiah
Rodgers, Fern T.
Rohde, Amanda R.
Rohrs, John R.
Rokeach, Milton
Rosenbaum, Max
Rosenthal, Bernard G.
Rosenzweig, Mark R.
Rostker, Leon E.
Royce, Joseph R.
Royer, Anne E.
Rubinow, Jean E.
Ruddy, Margaret M.
Rude, Axel S.
Ruesch, Herbert A.
Russell, James H.
Rutter, Henry B.
Sacks, Joseph M.
Salten, David G.
Sampliner, Donald W.
Sanderson, Margaret H.
Sanford, Katharine G.
Sang, Thomas N.
Saxe, Carl H.
Schaaf, Laurence J.
Schachter, Stanley
Schaefer, Vernon G.
Scheinfeld, Amram
Schmitt, Anthony J.
Schwartz, Bert D.
Seibert, Earl W.
Shapiro, Leon D.
Shattuck, Georgia A.
Shaycoft, Marion F.
Shevenell, Raymond H.
Shneidman, Edwin S.
Shoore, Audrey
Simos, Irving
Simpson, Mary Mathes
Sisti, Josephine E.
Slattery, Ralph J.
Slochower, Muriel C.
Slote, Walter H.
Smith, Alwood
Smith, Bessie S.
Smith, Burke M.
Smith, Walter J.
Sobel, Zelda
Sommers, Vita S.
Sparks, Charles P.
Srole, Leo
Staffler, Dominicia M.
Stanley, Robert H.
Steel, Marion S.
Stein, Elizabeth C.
Steiner, Blanche F.
Steinmayer, Jean Katherine
Stevens, Wilmer E.
Stewart, Naomi
Stoute, Argyle
Stubblefield, Eben M.
Suchman, Edward A.
Sullivan, Ben A.
Sullivan, Bernard C.
Sullivan, Helen B.
Swift, Joan W.
Swink, Clyde W.
Tait, Arthur T.
T'an Yun En (Fred Tom)
Taylor, Caroline
Templin, Mildred C.
Teuber, Hans-Lukas
Thacker, Leslie H.
Thayer, Lyman R.
Theaman, Milton
Theman, Viola
Thibaut, John Walter
Thomas, Ethelbert, Jr.
Thomasson, Cecil W.
Thompson, Kenneth H.
Thune, Leland E.
Tieleman, Adrian
Treverton, William M.
Tsitsos, William P.
Vane, Julia R.
Van Houten, Lyman H.
Vaughan, Gerald W.
Vick, Mary Gale
Voeks, Virginia W.
von Lackum, William J.
Waldman, Lester J.
Walsh, Merrick, K.
Weinberg, Henry
Wells, Frank H.
Welsh, George S.
Wenzel, Bernice M.
Werner, Henry C.
Wertman, Hazel E.
White, Mary A.
White, Milburn J.
White, Stella H.
Whittaker, Betty Ann
Whittredge, Donald G.
Wiley, John H.
Williams, Margaret C.
Williamson, St. John, Jr.
Winkler, Walter H.
Winne, John F.
Withey, Stephen B.
Wolf, Helen R.
Wolf, Klara C.
Wolfson, Beatrice N.
Woods, Walter A.
Wren, Harold A.
Wright, James C.
Yale, John R.
Young, Florene M.
Yum, Louise G.
Zeller, Anchard F.
Zeran, Franklin R.
Zeuch, Jacqueline
Ziesmer, Nancy J.
Zimmerman, George V.
Zulick, Dorothy M.

Upon recommendation of the Council of Directors the Association voted:

That the following Program Committee be appointed for 1945: Harold Burtt, Chairman, Dael Wolfle, and the Secretary.

That W. N. Kellogg of the Indiana University be continued as Chairman of the Committee on Precautions in Animal Experimentation.

That the Committee on Audio-Visual Aids be continued with C. R. Carpenter as Chairman and with Lester F. Beck, Mark A. May, and Willard L. Valentine as members. It is further recommended (a) that the Committee on Audio-Visual aids be authorized to represent the APA in the Science Films Committee, on the Advisory Board of the Psychological Cinema Register, and similar agencies; (b) that the Committee continue to encourage the production of films designed for instruction in psychology; (c) that the Committee, in cooperation with the Program Committee, plan the film program for the Annual Meeting; (d) that the Committee work out with John E. Anderson, Editor, plans for the publication of reviews of acceptable films in the *Psychological Bulletin;* and (e) that no action be taken at this time on the proposals to develop a plan for a *seal of approval* or the establishment of a library of films in the office of the Secretary. (See Reports)

That the Committee on Psychology and the Public Service, L. J. O'Rourke, Chairman, be discontinued with the thanks of the Association for past services.

That the Committee on the Preparation of Examinations Questions in Psychology be discontinued.

That the report of the Committee on Investments, Willard L. Valentine, Chairman, be accepted with thanks, ordered printed in the Proceedings, and that the Committee be continued with its present membership. (See Reports)

That the progress reports of the Committee on Scientific and Professional Ethics, L. L. Thurstone, Chairman, be acknowledged and the Committee commended for its handling of the problems referred to it for adjustment. Council further recommends the continuation of Professor Thurstone as Chairman, and the appointment of Calvin Stone for the term 1944–1948 to replace A. T. Poffenberger whose term expires.

At this point in the Business Meeting there was some discussion of the order of presentation of items concerned with the reorganization of the American Psychological Association. After a brief discussion it was agreed that it would be proper to act on the report of the Committee on the Constitution and its continued activity for the coming year irrespective of subsequent decisions on the proposed new By-Laws and amendments. Upon recommendation of Council the Association accordingly voted:

That the report of the Committee on the Constitution, Ernest Hilgard, Chairman, (see Reports) be accepted with thanks and ordered printed in the Proceedings. It was further voted:

(a) That the Committee on the Constitution be continued with its present members and additional members to be appointed by the President in consultation with the President of the AAAP.

(b) That the Committee on the Constitution continue to serve as a liaison committee with the AAAP in perfecting the proposed By-Laws of the new APA organization.

(c) That the Committee on the Constitution, acting jointly with the corresponding committee of the AAAP, be specifically instructed to study the question of representation of state and regional societies under the proposed new By-Laws, and to propose desirable amendments to the By-Laws for action of the Association.

(d) That the sum of six hundred dollars ($600.00) be appropriated for the expenses of the Committee.

President Murphy next called on Calvin Stone to present the results of the mail ballot conducted by the Election Committee on the wishes of Associates and Members concerning the proposed new By-Laws. A duplicated summary (See Reports) was placed in the hands of each person present and Professor Stone commented on the trends.

Further action at the Business Meeting of the American Psychological Association was contingent upon prior favorable action at the Business Meeting of the American Association for Applied Psychology. Alice I. Bryan, Secretary of the AAAP, was called upon for a report of actions taken by that organization. She reported that the following motions had received an unanimous vote:

Moved that, in view of the wishes of the membership as expressed in the mail ballot, the American Association for Applied Psychology recommend to the American Psychological Association that it amend its By-Laws in accordance with the attached proposal.

Moved that, the AAAP recommend to the Joint Constitutional Committee that the provisions in the By-Laws regarding regional representatives and the affiliation of local psychological societies be given special study with a view to possible revision of these provisions.

Moved that, the AAAP recommend to the Joint Constitutional Committee that the provisions in the By-Laws regarding the number and nature of the proposed charter Divisions of the reorganized APA be given special study with a view to possible revision of these provisions.

Moved that, the AAAP authorize the incoming Board of Governors to take whatever steps may be necessary to effect the legal dissolution of the association when the reorganized APA begins to function in September, 1945.

Ernest R. Hilgard, Chairman of the Committee on the Constitution and of the Joint Committee, was next asked to describe the procedure by which the Association might proceed to reorganize itself so as to begin operation under new By-Laws to become effective at the Annual Meeting in 1945 without any lapse in continuity as an incorporated organization. Copies of the proposed By-Laws as distributed for the mail ballot were available at the meeting and are Exhibit A of the printed report of the Joint Committee as contained in these Proceedings. The "Provisions for the Transitional Year, 1944–1945" as prepared by the Committee on the Constitution (See Reports) were placed in the hands of each person present in mimeographed form. The legality of proposed changes had been cleared with a lawyer familiar with these matters and plans for transition worked out with him. His findings and recommendations are included in a letter which is Exhibit B in the report of the Joint Committee. After some general questions and discussion the Association voted unanimously as follows:

> That the By-Laws as printed in the 1944 Yearbook, together with such amendments as may be voted for the year 1944–1945, be rescinded as of the date of the annual meeting in September, 1945;
>
> That the amended By-Laws as approved by mail and as presented at this meeting be adopted to be effective at the date of the annual meeting in September, 1945;
>
> That following termination of reports from officers and committees and other old business at the annual meeting of September, 1945, the presiding officer shall declare the amended By-Laws to be in effect and shall call for a motion adjourning the annual meeting of members. At the termination of this meeting, the Council of Representatives elected in 1945 shall convene under the newly elected President and assume their duties under the amended By-Laws. The Secretary and Treasurer shall continue to serve until their successors are elected and qualify.

Attention was next directed to the amendments to the existing By-Laws which had been proposed in the provisions for the transitional year. In the discussion it was noted that the list of five divisions, continuing the sections of the AAAP, was incomplete because of an omission in mimeographing. An amendment was offered and voted upon favorably to edit to add the Division of Educational Psychology and the Division of Military Psychology in Section 1, Part c, second sentence.

There was a discussion of the possibility of wishing to make some changes in the By-Laws with legal force by a mail ballot. The Association accordingly voted the addition of the following to the Provisions for the Transitional Year:

> That the present Article XII, Amendments, be deleted and the following substituted: Amendments to the new By-Laws may be proposed by the Committee on the Constitution and submitted to the membership by mail. If two-thirds of the Members and Associates casting a ballot vote favorably the amendments will be in effect at the same time as the new By-Laws in September 1945 provided that at least 50 Members have voted.

The Association next unanimously voted to adopt the amendments in the plans for the Transitional Year as further amended above. (See Reports)

With the completion of the necessary legislation for the reorganization President Murphy again presented the prepared recommendations from Council and the Association voted as follows:

> That the sum of two hundred dollars ($200.00) be appropriated for the work of the Election Committee.
>
> That December be substituted for November in Article X, Section 3, sentence 2 of the By-Laws to make the sentence read: The reports of the Secretary and Treasurer shall be printed annually in the December issue of the *Psycho-*

logical Bulletin. Meeting the November deadline has always been difficult and present printing schedules make the change advisable.

That the Committee on War Services to Children, Arthur T. Jersild, Chairman, be discontinued with thanks.

That the Committee on Publicity and Public Relations, Floyd Ruch, Chairman, be continued with a new membership to be appointed by the incoming president.

That the Committee on Standardization of Measures of Electrical Skin Resistance, G. L. Freeman, Chairman, be discontinued.

That the Committee on Graduate and Professional Training of Psychologists, Edwin R. Guthrie, Chairman, be continued with thanks for its work on the program of the Annual Meeting, and that Carroll L. Shartle be named an added member.

That Williard C. Olson be continued as representative to the AAAS and Jean Macfarlane be appointed to succeed A. T. Poffenberger.

That the progress report of its representative, H. B. English on the Council of Human Relations in Conservation of the AAAS be acknowledged with thanks and that H. B. English be continued as representative.

That the report of Steuart H. Britt, the Association's representative in the American Documentation Institute, be accepted with thanks and ordered printed in the Proceedings, and that Dr. Britt be continued as representative.

That the progress report of Harold O. Gulliksen as a representative to the American Standards Association be accepted with thanks and that Dr. Gulliksen be continued as representative.

That the report of the delegates to the Inter-Society Color Council be accepted with thanks and ordered printed in the Proceedings, and that affiliation with the Inter-Society Color Council be continued. (See Reports) The Association further voted that the present delegation be continued with its Chairman, Forrest Lee Dimmick. The delegation had inadvertently been increased to 11 with an ISCC rule that 10 is the limit. The Association voted that the delegation be reduced by the withdrawal of the name of Clarence H. Graham.

That the report of Joseph Zubin, representative to the Division of Personnel of the National Committee for Mental Hygiene, be accepted with thanks and ordered printed in the Proceedings and that Theodora M. Abel be named as representative to succeed Dr. Zubin. (See Reports)

That the report of Leonard Carmichael, Chairman of the Division of Anthropology and Psychology of the National Research Council, be accepted with thanks and ordered printed in the Proceedings. (See Reports)

That the report of Richard M. Elliott, senior representative to the Social Science Research Council, be accepted with thanks and ordered printed in the Proceedings. (See Reports)

That the report of Louis Long, named by Council as interim representative to the National Council of Rehabilitation, be accepted with thanks and ordered printed in the Proceedings. (See Reports)

That the association continue affiliation with the National Council of Rehabilitation and that the annual dues of $25.00 be authorized until further action. It was further voted that Louis Long be named the representative of the Association.

That the Association appropriate $10,000 for the support of the Office of Psychological Personnel to be expended by the Treasurer according to a budget to be approved by Council. It is understood that any unexpected balance as of December 31, 1945, shall revert to the Association.

That $2.00 be assessed on Members and Associates to assist in financing the Office of Psychological Personnel and that foreign Members and Associates be exempted from the assessment.

That the Association accept the application of the Society of Experimental Psychologists for affiliation. Application was made under date of April 14, 1943 and presented at the 1943 Annual Meeting as required by the By-Laws.

That the Association create a committee to be appointed by the incoming President with the title: Committee on International Planning for Psychology. The function of this committee will be to study and advise on the rehabilitation of psychological laboratories and libraries, to initiate or cooperate in plans for an International Congress, and to cooperate with various movements designed to promote better international understanding and progress.

That the incoming President in consultation with the new president of the AAAP be asked to appoint a small liaison Committee on Official Journal to work with a committee of the AAAP to formulate recommendations on policies with respect to the official journal of the proposed new APA organization and to report any recommendations affecting the present practices of the APA to the Board of Editors at a meeting not later than February of 1945.

That the Association appoint a Committee on Standards for Psychological Service Centers, jointly with the AAAP, to consist of David Shakow, Chairman, Jerry W. Carter, Norman Fenton, Donald B. Lindsley, C. M. Louttit, Marie Skodak and Robert M. Yerkes.

That the new President appoint a Committee on Utilization in Psychology of Surplus War Materials.

That the Association adopt the following resolution in principle: WHEREAS education is an important force for creating a lasting peace and post-war stability, and, WHEREAS psychologists are concerned with the effective implementation of educational forces both from the point of view of research and application BE IT RESOLVED that the American Psychological Association go on record as favoring the organization of an International Office for Education.

That the report of the Treasurer and Business Manager of Publications, W. L. Valentine, for the year ending December 31, 1943, be approved and ordered printed in the Proceedings. The report is supplemented by a report of the auditors. (See Reports)

That the treasurer's budget for 1945 be approved and ordered printed in the Proceedings. (See Reports)

That the Council be empowered to make arrangements for the 1945 meeting at a time and place and under such conditions as seem wise in terms of the progress of the war.

The Secretary read a letter from Dr. Paul H. Musser, Provost, inviting the Association through Professor Robert A. Brotemarkle to hold the Annual Meeting in September, 1946, at the University of Pennsylvania. Professor Brotemarkle was called upon for comments. He explained that 1946 would be the Fiftieth Anniversary of the Psychological Clinic and that appropriate celebrations were being planned. The invitation is, of course, subject to the needs of the Nation at the time. Since the Association will not act on time and place for the 1946 meeting until the 1945 meeting no particular action was taken.

President Murphy next called for any new business that any Member might wish to bring to the meeting. Horace B. English then presented the following statement, which was adopted by unanimous vote:

> The American Psychological Association at its Annual Meeting in Cleveland September 12, 1944, takes account of two influences adversely affecting the vocational, educational, and personal counseling of men and women being returned from the armed services to civil life: On the one hand there is a serious stultifying duplication of counseling which is certain to diminish its effectiveness; and on the other hand (and partly as a result of the duplication), too many of the counselors are most inadequately trained.
>
> The Association therefore instructs the Council of Directors to take active steps, by making appropriate representations to the Federal Government and the several agencies concerned and in any other way which shall seem effective, to minimize both these evils.

Professor Robert H. Seashore presented the following resolution of thanks which was adopted unanimously by the Association:

> Be it resolved that the American Psychological Association, assembled at the Fifty-second Annual Meeting, expresses its thanks to the Cleveland psychologists, city officials, and management of the Hotel Statler for their work in planning and carrying out the local arrangements for the meeting, and to the Officials of the American Association for the Advancement of Science for their cooperation. Be it further resolved that the Secretary be instructed to express this appreciation through Dr. Calvin S. Hall, local representative of the Executive Committee, and Dr. Sam Woodley, Assistant Secretary of the American Association for the Advancement of Science.

There being no further business, the meeting adjourned at 4:15 p.m.

PROGRAM

FIFTY-SECOND ANNUAL MEETING OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION, HOTEL STATLER, CLEVELAND, OHIO

Monday Morning, September 11, 9:00 a.m.; Pine Room

Symposium: Graduate and Professional Training of Psychologists.
Edwin R. Guthrie, *Chairman*

1. Job Analysis of the Actual Functions of Psychologists. Donald G. Marquis.
2. Basic Undergraduate Preparation. Bruce V. Moore.
3. Evaluation of Professional Work Done by Psychologists in Army, Navy, or Civilian Agencies During the Emergency. Sidney L. Pressey.
4. Survey of Present Training Facilities. Robert R. Sears.
5. Regularization of Practicum Facilities on a National Scale. Bruce V. Moore.

Monday Morning, September 11, 10:30 a.m.; Pine Room

1. Address of the President of the American Association for Applied Psychology.
   PSYCHOLOGY: ACADEMIC AND PROFESSIONAL. Albert T. Poffenberger, (Read by Alice I. Bryan).
2. Address of the President of the American Psychological Association. THE FREEING OF INTELLIGENCE. Gardner Murphy.

Monday Afternoon, September 11, 1:30 p.m.; Pine Room

Conference: Problems and Values of the Proposed Reorganization of Psychological Societies.

Robert M. Yerkes, *Chairman*

1. Opening remarks by Chairman.
2. Statement from the Joint Committee. Ernest Hilgard.
3. Arguments and Design for a Central Service Office at National Headquarters. Donald G. Marquis.
4. Proposed Divisional Structure of the National Organization. Edward E. Anderson, Dael L. Wolfle.
5. Problems of Affiliation and Representation. Harriet E. O'Shea, John G. Peatman.
6. Financial Support of the National Society. Willard L. Valentine.
7. Problems of Publication. Johnnie P. Symonds. Herbert S. Langfeld.

Monday Afternoon, September 11, 4:00 p.m.

Reserved for Meetings of Special Interest Groups.

1. Board of Governors, AAAP.
2. National Council of Women Psychologists.
3. Ohio Association of Applied Psychologists.
4. Psychometric Society.
5. Stevenson, Jordan, and Harrison, Inc.

Monday Evening, September 11, 7:00 p.m.; Pine Room

Roundtable: Instructional Films in Psychology. Arranged by the Committee on Audio-Visual Aids and the Psychological Cinema Register.
Willard L. Valentine, *Chairman*

Business meeting: Committee on Section I (Psychology).

Monday Evening, September 11, 8:00 p.m.

Address of the President of the American Association for the Advancement of Science.

COMMANDING OUR WEALTH. Isaiah Bowman. (Read by F. R. Moulton)

Tuesday Morning, September 12, 9:00 a.m.; Pine Room

Symposium: Psychology and Post-war Problems.
Calvin P. Stone, *Chairman*

1. Post-war Psychological Problems Relating to Radio and Television. Frank N. Stanton and Paul F. Lazarsfeld. (Read by Dr. Lazarsfeld)
2. Educational Acceleration and Post-war Scientific Leadership. Sidney L. Pressey.

3. Psychological Adjustments of Discharged Personnel and Their Families. Carl R. Rogers.
4. Occupational and Vocational Counseling of Military and Civilian Personnel During the Period of Post-war Demobilization and the Years Immediately Thereafter. C. L. Shartle.
5. Expanding Opportunities for Women Psychologists in the Post-war Period of Civil and Military Reorganization. Florence L. Goodenough.
6. Opportunities for the Expansion of Psychological Services and Research in Colleges of Agriculture and Engineering. H. H. Remmers.

Tuesday Afternoon, September 12; Pine Room

1:00 p.m.—Business Meeting of the American Association for Applied Psychology.

2:30 p.m.—Business Meeting of the American Psychological Association.

Tuesday Evening, September 12, 8:00; Pine Room

Joint Meeting of Sections I, Psychology, and Q, Education, American Association for the Advancement of Science.

1. Address of the Vice-President of Section Q.
   HOW FAR IS EXPERIMENTATION IN THE SOCIAL SCIENCES POSSIBLE? Harold Clark. (Read by H. H. Remmers)
2. Address of the Vice-President of Section I.
   A STIMULUS-EXPECTANCY NEED-CATHEXIS PSYCHOLOGY. Edward C. Tolman.

REPORTS

REPORT OF THE COMMITTEE ON AUDIO-VISUAL AIDS

To the Council of Directors and Members of the American Psychological Association:

The Audio-Visual Aids Committee has held four scheduled meetings during the current year. In addition, individual members have participated in many informal conferences.

During the past year a problem stated in the 1943 Report has been solved: The Psychological Cinema Register which has films useful in psychological instruction has been purchased by The Pennsylvania State College. The Cinema Register films are now available at that University for purchase or rental by other institutions.

Study of films being produced by Government Agencies, especially by the Armed Forces, is being continued with a view to finding and describing those subjects which are most suitable in psychological instruction. Several members of the AVA Committee have contributed to the production of training films, and one member is preparing a comprehensive evaluation of films produced for and used in military training.

Many of the problems outlined in the 1943 Report remain unsolved. The Committee is actively working on some of these as well as on newly formulated problems. The central objective of the AVA Committee is to *improve instruction* in various fields of psychology by encouraging instructors to use a wide range of training aids.

In the meeting of April 22, 1944, consideration was given to possibilities of cooperation between the AVA Committee and a Science Films Committee now in the process of being organized under the sponsorship of biological science societies. Through its AVA Committee, APA will be able to participate in the proposed organization. Contributions may be made to and benefits derived from coordinated activities of this worthwhile Committee which will represent all branches of American Science.

The opinion of the AVA Committee is that the production of quality training films, however desirable, requires more technical skill and resources than are available to most psychologists. Therefore the Committee has undertaken to sponsor the production of a series of instructional films by the following means:

1. Ascertaining what twelve or fourteen subjects in the field of general psychology, suitable for treatment by the medium of 16 mm. cinema photography, are most needed or wanted by a large number of experienced instructors.
2. Assisting in the writing of quality scripts dealing with the selected subjects.
3. Working out agreements with institutions, agencies and technically qualified individuals for the production of the selected films.
4. Encouraging the widest possible distribution and use of the completed films.

The AVA Committee believes that the quality of films used in the class room must be greatly improved. One step in the direction of improvement would be for the Association to appoint a Review and Appraisal Board. Acting under duly delegated authority, this Board would make detailed evaluations of psychological films. The Board's evaluations and criticisms should be published for the guidance of interested instructors. Films approved by the Board should be awarded a leader or trailer showing the official seal of the Association and the title: "*Approved by the Review and Appraisal Board of the American Psychological Association.*"

It is the opinion of the AVA Committee that some significant experiments should be recorded by means of films. Research workers are not always equipped to produce first-class film records of equipment, procedures and results. Considerable thought has been given to the possibilities of a mobile film production unit in order to provide filming services for investigators. It seems probable that this kind of service may be provided after the war through a co-operative arrangement with other branches of science. Provision for a mobile film service may be one of the functions of the previously mentioned Science Films Committee.

The possibilities of films which relate to the history of psychology have not been overlooked. Good historical films already made by psychologists should be collected, preserved and made available for use.

Likewise, unique films of excellent quality which already exist would have greater usefulness if incorporated in well-planned productions. An arrangement could be worked out for extending the usefulness of current high-quality psychological films. A film stock shot library is suggested as a possibility for solving this problem.

The AVA Committee holds the opinion that, in the past, the film and exhibit parts of the annual APA meeting have measured up to the possibilities of these exhibits only in a few instances. All such exhibits should be carefully planned and pre-viewed. Exhibitions should be arranged under the following topics:

1. Films of general and wide interest.
2. Selected instructional films.
3. Research record films. (Certain films should be shown repeatedly in order to be convenient for a number of members.)

The Annual Meetings afford an opportunity also for historical film records, especially of personalities. These opportunities have not been fully used in the past. Plans should be made for sound film recordings during the meetings of the Association.

A study is being made of recent advances in sound recording and reproduction equipment. Various types of apparatus are being evaluated for possible uses in psychological instruction.

The Armed Forces have made extensive developments in a wide variety of training aids and in their use. Preliminary study shows that a number of the procedures and types of equipment can be adapted for use in psychological instruction. A member of the AVA Committee is preparing a report on the subject.

In view of the possibility that colleges and universities will extend their building programs after the war, the AVA Committee has been interested in collecting information on designs of class-rooms, including wiring, lighting and projection facilities.

For effective use of training aids, more convenient facilities must be made available to instructors than in the past. Minimum steps in this direction are:

1. Class-rooms suitable for the use of motion picture films and other training aids.
2. An accessible library of films.
3. An effective projection service at the command of the instructor. The AVA Committee is working on the preparation of descriptions of several types of proved plans for inaugurating and operating the training aids programs. These plans will be published in order to help department heads and psychology instructors adapt to local conditions an arrangement for using training aids.

Specific Recommendations. The Audio-Visual Aids Committee respectfully recommends to the Council:

1. That the AVA Committee be authorized to represent the interests of APA in the developing Science Films Committee.
2. That the Council of APA authorize the AVA Committee to continue to sponsor the production of a series of quality films designed to aid in the instruction of general psychology.
3. That the Council appoint a Board of Review and Appraisal or authorize the AVA Committee to act as a Board to evaluate psychological films and to award to producers of films of merit the privilege of using the Seal of the Association. It is suggested that a nominal fee be charged for the use of the Seal to cover costs of this service.
4. That a Stock Film Library be developed in the Office of the Secretary of the Association for short film sequences of historical merit and of quality film which might be widely used. It is suggested that this beginning may develop into a depository for approved psychology films.
5. That the AVA Committee be charged with the responsibility for all film and training aids exhibits on the program of the Annual Meetings of the Association.
6. That the AVA Committee be continued with the following members: Lester F. Beck, Clarence R. Carpenter, Mark A. May and Willard L. Valentine.

Copies of the AVA Committee minutes and summaries of conferences are submitted with this report to the Secretary of the Association.

Respectfully submitted,

KENNETH H. BAKER
LESTER F. BECK
MARK A. MAY
MILTON METFESSEL
WILLARD L. VALENTINE
CLARENCE R. CARPENTER, *Chairman*

REPORT OF THE INVESTMENT COMMITTEE AS OF DECEMBER 31, 1943

To the Council of Directors and Members of the American Psychological Association:

The invested surplus of the American Psychological Association as of December 31, 1943, amounted to $69,493.43, which was distributed as follows:

Savings Accounts:		
The Ohio National Bank, Columbus, Ohio		$ 2,944.58
People's Savings Bank in Providence, Providence, Rhode Island:		
General	$2,295.13	
Special	3,181.94	5,477.07
Princeton Bank and Trust Co., Princeton, New Jersey		5,707.37
Providence Institution for Savings, Providence, Rhode Island		2,676.69
Rhode Island Hospital Trust Co., Providence, Rhode Island		2,057.52
Security-First National Bank of Los Angeles, Los Angeles, California		2,710.24
Union Square Savings Bank, New York, N. Y.		5,181.85
Wells Fargo Bank & Union Trust Co., San Francisco, California		2,829.23
Huntington National Bank of Columbus, Columbus, Ohio		2,708.88
Total in Savings Accounts		$32,293.43

	Book Value	*Market Value*
Marketable Securities:		
U.S. Savings Bonds—Series G 2.5s, due November 1, 1953	$ 5,000.00	$ 4,810.00
U.S. Savings Bonds—Series G 2.5s, due December 1, 1954	25,000.00	24,450.00
Total U.S. Savings Bonds	$30,000.00	$29,260.00
Chesapeake & Ohio Railway Co., refunding and improvement mortgage 2.6s, Series G, due February 1, 1960	8,000.00	7,940.00
Total securities	$38,000.00	$37,200.00
Total invested		$69,493.43

Of this amount $7,854.54 is reserved for special purposes, leaving the free capital investment of $61,638.89. Of the reserved funds $3,181.94 was authorized by Council to be deposited in a special savings account to be used for postwar reconstruction of psychology, and $4,672.60 represents surplus funds arising from publication of the *Journal of Abnormal and Social Psychology*, which under terms of the gift, are to be used solely for the purposes of that journal.

The total interest received during the year was $449.37 on the savings accounts and $958.00 on the other investments.

Net income on all operations of the Association during 1943 was $1,079.22, which represents an appreciable drop from $4,709.64 in 1942 and indicates that surplus funds may have to be used to meet obligations during 1944.

The net worth of the Association on December 31, 1943, was $52,178.49 compared with $50,151.99 at the close of 1942, and $56,240.05 at the close of 1941.

The Committee recommends it continuance.

Respectfully submitted,
Leonard Carmichael
Samuel W. Fernberger
Willard L. Valentine, *Chairman*

REPORT AND RECOMMENDATIONS OF THE JOINT CONSTITUTIONAL COMMITTEE OF THE APA AND THE AAAP: ENABLING ACTION FOLLOWING THE INTERSOCIETY CONSTITUTIONAL CONVENTION

The proposed amended By-Laws (Exhibit A) of the American Psychological Association embody the recommendations from the Intersociety Constitutional Convention held in New York May 29–31, 1943, and the subsequent instructions from the Council of Directors of the APA, and the Board of Governors of the American Association for Applied Psychology at their meetings in September 1943 together with comments received following the advisory vote from all American psychologists in early 1944. These have been stated in a form which is legally acceptable under the laws of the District of Columbia, under which the APA is incorporated. A letter of advice from the attorney consulted is attached (Exhibit B).

The following steps are proposed:

1. Mail votes of approval or disapproval by the members of the APA and the AAAP (Exhibit C). These votes are advisory only, but are important as expressions from the membership, in case the actual business meetings at which actions are taken should be small.

2. A vote of approval by the AAAP at a regular business meeting (Exhibit D). This should be transmitted to the APA prior to its action at its business meeting in September 1944.* If the action by the AAAP is affirmative it will give the APA encouragement to proceed with the amendment of its By-Laws.

3. Formal action by the APA, amending its By-Laws as suggested (Exhibit E). (From a legal point of view, all that is being done is to amend the By-Laws of the APA. This is the recommendation of the Intersociety Constitutional Convention, but it would not be in the spirit of the Convention to proceed with this series of amendments unless the AAAP concurred in them.)

JOINT CONSTITUTIONAL COMMITTEE

Representing APA	*Representing AAAP*
J. E. Anderson	Alice I. Bryan
E. R. Hilgard, *Chairman*	C. M. Louttit, *Secretary*
W. L. Valentine	S. L. Pressey

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* In case final action is postponed the years 1944 and 1945 are understood to mean the year of official vote and the transitional year following the vote.

EXHIBIT A

PROPOSED BY-LAWS FOR THE AMERICAN PSYCHOLOGICAL ASSOCIATION*

CONTENTS

Article		Page
I.	Object	746
II.	Membership	746
III.	Council of Representatives	748
IV.	Divisional Representatives	749
V.	Regional Representatives	750
VI.	Special Representatives	750
VII.	Divisions	750
VIII.	Board of Directors	752
IX.	Officers	753
X.	Corporate Seal	755
XI.	Nominations and Elections	755
XII.	Policy and Planning Board	756
XIII.	Committees	756
XIV.	Affiliations and Branches of the Association	758
XV.	Affiliations of the Association with Other Organizations	759
XVI.	Central Office	759
XVII.	Publications	760
XVIII.	Annual Convention	761
XIX.	Subscriptions	762
XX.	Amendments	762
	Enabling Action	762

ARTICLE I

OBJECT

1. The object of the American Psychological Association shall be to advance psychology as a science, as a profession, and as a means of promoting human welfare.

ARTICLE II

MEMBERSHIP

1. The Association shall consist of three classes of members: Fellows, Associates, and Life Members.

2. Fellows of the Association shall be persons who are primarily engaged in the advancement of psychology as a science and as a profession, and who have met standards of proficiency as described below. Fellows shall be entitled to all the rights and privileges of the Association without restriction. (All those now Members of the existing APA and those now Fellows of the existing AAAP shall be Charter Fellows of the Association.)

3. The minimum standards for Fellowship shall be (1) a Doctor's degree based in part

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* Material in parentheses includes suggestions for transition from present arrangements. This material will not be a permanent part of the By-Laws.

Editorial notes are introduced occasionally to explain committee action, especially where changes have been made since the edition of the By-Laws published in the *Psychological Bulletin*, 1943, **40**, 626–645.

upon a psychological dissertation conferred by a graduate school of recognized standing, except when waived in special cases by the Council of Representatives, (2) prior membership as an Associate, and (3) either acceptable published research of a psychological character beyond the doctoral degree, or four years of acceptable professional experience subsequent to the granting of the doctoral degree. The Council of Representatives shall have the power to designate further standards to be met in the election of Fellows. Divisions may require higher standards than those set by the Council for the Association as a whole. Nominations for Fellow must include: (1) evidence that the minimum Association standards have been met, and (2) recommendation by one of the Divisions of the Association, specifying the designation to be used. Except for Charter Fellows, who shall continue as such unless recommended by a Division for designation, all Fellows shall be designated by a name chosen by the Division so specifying them; (e.g. Fellow in Industrial Psychology, Fellow in Physiological Psychology, Fellow in Abnormal Psychology).

4. Associates shall be persons who are interested in the advancement of psychology as a science and as a profession, and who are either in training or in practice in psychology or a field of closely allied interest. Associates shall be entitled to all the rights and privileges of the Association, except those specifically denied them in these By-Laws. (Present APA Associates and AAAP Associates shall be Charter Associates.)

5. Associates shall be (1) persons with the Doctor's degree based in part upon a psychological dissertation and conferred by a graduate school of recognized standing; or (2) persons who have completed at least two years of graduate work in psychology in a recognized graduate school or one year of graduate study plus a year of experience in professional work that is psychological in nature and who, at the time of application, are devoting full time to professional or graduate work that is primarily psychological in nature; or (3) be scientists, educators, or other distinguished person whom the Board of Directors may recommend for sufficient reason.

6. Life Members shall be persons who, having reached the age of sixty-five years and having been Associates or Fellows of the Association for at least twenty years, request such status. Although Life Members shall be exempt from paying dues, they shall retain all other rights and privileges of the Association except that of receiving journals covered by membership subscriptions. They may subscribe for such journals, if they so desire, at the rate paid by the Association for active members. (Life Members of the existing APA shall retain their status as Life Members. In counting the years of membership in the Association, years in the present APA or AAAP shall be counted.)

7. In addition to the regular membership classes, there shall be two classes of affiliates who are not members of the American Psychological Association, and shall not represent themselves as such unless and until they have met the membership requirements for Associates or Fellows and been elected to membership. These two classes shall be, first, Student Affiliates; second, Division Affiliates.

8. Student Affiliates shall be graduate students or undergraduate students majoring in psychology or related fields. Student affiliates shall have such rights and privileges as may be granted by the Council of Representatives, including special rates for journal subscriptions.

9. Division Affiliates shall be persons who belong to a Division of the Association but who do not hold membership in the Association itself. A Division may include those who are competent in related fields but who either do not qualify for Association membership or do not wish such membership.

10. Fellows and Associates shall be elected by a majority vote of the Council of Representatives present at any annual business meeting, upon nomination of the Board of Directors. Affiliates are recognized by the Executive Secretary without election upon securing the necessary endorsement and the paying of fees.

11. Divisions may establish such classes of membership within the Division as they see fit, except that the designation Fellow shall be reserved for members of the Division who are also members of the Association and elected as Fellows according to the provisions of Section 3.

12. Any Fellow, Associate, Student Affiliate, or Division Affiliate may be expelled for cause by an affirmative vote of two-thirds of the members of the Council of Representatives present at any annual business meeting. Such vote shall be taken only upon recommendation of the Committee on Scientific and Professional Ethics, after that committee has given the member or affiliate an opportunity to appear before it to answer the charges against him, and after the Committee's recommendations have been reviewed and approved by the Board of Directors.

13. Procedures for application for membership and affiliateship in the Association and for transfer from Associate to Fellow shall be prescribed by the Council of Representatives.

ARTICLE III

Council of Representatives

1. There shall be a Council of Representatives which shall be the legislative body of the Association and shall have full power and authority over the affairs and funds of the Association within the limitations set by these By-Laws. It shall have the authority to elect members and to expel members. It shall have the power to provide for the making of such contracts and the delivery of such deeds, documents, and instruments as shall be necessary for the carrying out of all the purposes, functions and business of the Association as provided by these By-Laws. It shall decide all questions involving cooperation with other national organizations and may make such changes in policy or administration as it deems advisable, consistent with these By-Laws. It may recommend amendments to the By-Laws. It shall have the authority to delegate powers and responsibilities to the Board of Directors, the Committee on Publications and the Policy and Planning Board, in addition to those already designated by these By-Laws.

2. The Council of Representatives shall be composed of the Division Representatives, Regional Representatives, and Special Representatives, together with the officers of the Association, including the President, the President-Elect, the Recording Secretary and the Treasurer. The President of the Association shall preside at the meetings of the Council of Representatives and, in his absence or disability, the President-Elect shall preside. Representatives and officers on the Council shall hold office until their successors are elected and qualify.

3. Regular business meetings of the Council of Representatives shall be held in September of each year, the time and place of meeting to be decided by vote of the Council. Special meetings may be called by vote of the Board of Directors, and shall be called upon the written request of ten members of the Council. Notices of meetings, in writing, for every annual or special meeting of the Council of Representatives shall be prepared and mailed to the last known post office address of each Representative not less than fifteen days before any such meeting, and, if for a special meeting, such notices shall state the object or objects thereof, and no business shall be transacted except that stated in the notice for said special meeting. The Council of Representatives shall publish its minutes and proceedings in the official journal of the Association. On important matters of policy, the minutes shall include a record of those Representatives voting for and against a motion. Any vote shall be recorded if one-fourth of the Representatives present so request. Meetings of the Council of Representatives, except those specifically designated as Executive sessions, shall be open to members of the Association.

4. Upon petition of 100 members in good standing at the time of the petition's filing with the Recording Secretary, or upon majority vote of any duly constituted Division, any matter of legislation may be brought to the attention of the Council of Representatives, which shall vote upon it at its next regular meeting.

5. Upon petition of 200 members in good standing at the time of the petition's filing with the Recording Secretary, a request for a mail vote of the members of the Association upon a question of policy of legislation—either concerning a past action to be recalled or a new action to be initiated, but not involving an Amendment to the By-Laws—may be addressed to the Council of Representatives, which shall present the matter covered by the petition, if it is not inconsistent with the By-Laws, to the members of the Association for a mail vote on an appropriate ballot which shall present the legislation proposed and which may contain arguments for and against the legislation. The results of such a vote shall be counted by the Election Committee. When the Election Committee certifies the result to the Council of Representatives, the latter shall, if there is a majority of those voting in favor, make the legislation operative. (For Amendments to the By-Laws, see Article XX.)

6. A majority of the members of the Council of Representatives shall constitute a quorum.

7. The Council of Representatives shall be authorized to adopt and publish rules and codes for the transaction of its business, provided they do not conflict with these By-Laws.

ARTICLE IV

DIVISIONAL REPRESENTATIVES

1. Representatives of a Division, who shall be members of the Division and of the Association, shall be elected by those members of the Division who are also members of the Association.* Representatives of a Division shall be elected annually, but their renomination shall be automatic for two succeeding elections, provided they retain membership in the Association and the Division. Renomination shall not be permitted after three years on the Council without at least one year intervening.

2. The number of Representatives which any one Division shall have on the Council is determined annually in accordance with the number of members within the Division who are members of the Association. Total representation shall be determined as follows:

Members of the Division who are Associates or Fellows of the Association	Number of Representatives on the Council
200 or less	2
201 to 400	3
401 to 600	4
601 to 800	5
801 and over	6

3. If the same person should be elected as Representative of more than one Division he may serve in such dual capacity, except that he shall count as only one in determining a quorum or in any vote of the Council.

* Editor's Note: While it is desirable that officers of Divisions be eligible as Divisional Representatives, the earlier specification that Divisional chairmen and secretaries automatically be representatives has been withdrawn because of limitations which would have to be imposed upon the Divisions in the choice of their officers.

ARTICLE V

REGIONAL REPRESENTATIVES

1. It shall be the duty of the Regional Representative to call to the attention of the Council any matters relating to the welfare of psychology in his region. He shall also be responsible for representing the Association in his area on various formal occasions, and promoting the interest of psychology in conformity with the policies of the Council.

2. There shall be nine Regional Representatives elected for a term of three years, one from each of the following regions:

I. *New England:* Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont.
II. *Middle Atlantic:* Delaware, District of Columbia, Maryland, New Jersey, New York, Pennsylvania.
III. *East North Central:* Illinois, Indiana, Michigan, Ohio, West Virginia, Wisconsin.
IV. *West North Central:* Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota.
V. *Southeastern:* Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Virginia.
VI. *Southwestern:* Arizona, Arkansas, Louisiana, New Mexico, Oklahoma, Texas.
VII. *Rocky Mountain:* Colorado, Idaho, Montana, Wyoming, Utah.
VIII. *Pacific:* California, Hawaii, Nevada, Oregon, Washington.
IX. *Dominion of Canada.*

3. The Regional Representatives shall be members of the Association and shall be elected by preferential mail ballot of such members as are resident in the region at the time of election. Nomination shall be by the members resident in the region, in accordance with the provisions of Article XI. (In order to place into effect, during the first year the Regional Representatives for Regions I, IV, and VII shall be elected for a term of one year, those for Regions II, V, and VIII for a term of two years, and those for Regions III, VI, and IX for a term of three years.)

ARTICLE VI

SPECIAL REPRESENTATIVES

1. The Council may at its discretion propose Special Representatives of groups not qualifying as Divisions of the Association, but with reason to be represented by virtue of relation to the objectives of the Association, except that there shall not at any one time be more than three such Representatives, and no group shall have more than one such Representative. Special Representatives shall be elected annually by the group specified by the Council, subject to renomination and re-election according to the practice for Representatives of Divisions. Special Representatives and those who elect them must be members of the Association.*

ARTICLE VII

DIVISIONS

1. The special interests that lie within the Association shall be represented by Divisions.

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* It is specified by vote of the Intersociety Constitutional Convention that a Special Representative of teachers of psychology in Negro institutions of higher learning shall be included, if the organization of this group so elects.

2. Every member of the Association shall be a member of at least one Division and may become a member of other Divisions under the rules of eligibility and election established by them.

3. Members of the Association not expressing a preference for a special Division shall be members of a Division of General Psychology.

4. A Division shall be set up whenever fifty or more Associates and Fellows of the Association petition for it and the Council of Representatives approves. A two-thirds vote of those present at any annual business meeting of the Council of Representatives is required for the establishment of a new Division. The Council may create such divisions provided (1) that they represent the emergence of an active and functionally unitary interest of a group of members, (2) that the interest falls within the scope of the Association as defined in Article I, (3) that the membership is not restricted to a geographical area, and (4) that the establishment of the Division is not inimical to the welfare of any other Division already established. Divisions when formed from existing societies or organized as new societies may use a society name, provided they append to it the phrase: "A Division of the American Psychological Association."

5. A division may be dissolved by a majority vote of those present at an annual business meeting of the Council of Representatives (1) when the number of Associates and Fellows within the Division falls below fifty, or (2) when two-thirds of the total membership of the Division recommend dissolution. The Council may also dissolve a Division by a two-thirds vote of those present at an annual meeting (3) for good and sufficient reason, provided the reason for dissolution is stated in writing by the Council to the membership of the Division.

6. A Division remains autonomous in all matters within its field that are not reserved to the Association and the Council of Representatives by these By-Laws. It determines its own qualifications for its membership classes and it determines what persons among its membership shall have the right to vote in Divisional matters.

7. The elected Representatives of a Division on the Council of Representatives shall be members of the Association, and shall be chosen by and only by the members of the Division who are also Associates or Fellows of the Association.

8. A Division shall have at least a Chairman (or President) and Secretary, and may have such other officers as it may desire. The qualifications for the Chairman (or President) and Secretary shall be determined by the Division, and the method of their election shall be considered a Divisional matter.

9. Each Division shall draw up its own By-Laws and rules of procedure within the framework of these By-Laws, and not inconsistent with these By-Laws. Each Division may elect such officers and appoint such committees, in addition to those prescribed in these By-Laws, as it may deem necessary for the conduct of its business, and may adopt such regulations outlining the duties of its officers, the Division Council, and committees as it may desire, except that its committee structure is subject to review by the Committee on Committees of the Association (Article XIII). A committee proposed by a Division which is more properly a committee of the Association may become a special committee of the Association on recommendation of the Committee on Committees. Each Division shall file with the Recording Secretary of the Association a copy of its By-Laws and regulations.

10. A Division may administer a journal or special funds allocated to its use, but may delegate such administrative functions to the Council of Representatives or to the Central Office.

11. The charter Divisions of the Association shall be:

1. Division of General Psychology
2. Division on the Teaching of Psychology

3. Division of Theoretical-Experimental Psychology
4. The Psychometric Society—A Division of the American Psychological Association*
5. Division on Evaluation and Measurement
6. Division of Physiological and Comparative Psychology
7. Division on Childhood and Adolescence
8. Division of Personality and Social Psychology
9. The Society for the Psychological Study of Social Issues—a Division of the American Psychological Association*
10. Division on Esthetics
11. Division on Abnormal Psychology and Psychotherapy
12. Division of Clinical Psychology
13. Division of Consulting Psychology
14. Division of Industrial and Business Psychology
15. Division of Educational Psychology
16. Division of School Psychologists
17. Division of Personnel and Guidance Psychologists
18. Division of Psychologists in Public Service
19. Division of Military Psychology

ARTICLE VIII

BOARD OF DIRECTORS

1. The Board of Directors shall consist of the President, the President-Elect, the Recording Secretary, the Treasurer, and six others elected by a preferential ballot by the Council of Representatives from among its own members. Directors shall serve for terms of three years and their term of service on the Board of Directors may outlast their membership in the Council of Representatives. All members of the Board of Directors shall serve until their successors are elected and qualify. (In order to place into effect staggered terms for the six Directors, at the first election two shall be elected for one year, two for two years, two for three years.)

2. Regular meetings of the Board of Directors shall be held semi-annually; one just prior to the annual business meeting of the Council of Representatives in September, the other approximately six months later, at a time and place to be specified by vote of the Board of Directors. Special meetings of the Board of Directors may be held at any time on the call of the President or the Recording Secretary. A quorum at any meeting shall consist of a majority of the entire membership of the Board of Directors.

3. In the case of disability or resignation of a Director, the Council may fill the vacancy for the unexpired term.

4. The Board of Directors shall be the administrative agent of the Council and shall exercise general supervision over the affairs of the Association. It shall nominate new Fellows and Associates, and shall make recommendations concerning the administration of the Association to the Council. It shall transact all business referred to it by the Council, provided, however, that the action of the Board shall not conflict with recorded votes of the Council of Representatives or these By-Laws. The Board of Directors shall supervise the work of the Executive Secretary and other employees of the Association. In the interval between annual elections, the Board of Directors shall have the power to fill vacancies created by the death, disability, or resignation of elected representatives to other organizations. In the interval between the annual business meetings of the Council of Representatives, the Board of Directors shall have authority over the affairs

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* In case of adoption of these By-Laws, formal invitation will be extended to the named societies to become Divisions.

of the Association and shall take such actions as are necessary for the conduct of the Association, except that no action shall be taken which is contrary to an action taken by the Council of Representatives at its annual business meeting or which is inconsistent with these By-Laws. The Board of Directors shall make a report of its transactions at each regular meeting of the Council of Representatives.

5. If an emergency arises between annual meetings of the Council of Representatives, the Board of Directors shall have the power to change plans for meetings, to expend such funds, and to take such other actions in the name of the Association as it may deem necessary and wise, provided, however, that no action shall be taken under this emergency clause until an affirmative vote of two-thirds of the members of the Council of Representatives declaring that an emergency exists be secured and provided that all actions so taken be recorded and made available at the next succeeding meeting of the Council of Representatives and that all financial transactions shall pass through the Treasurer's office and be recorded and audited in accordance with these By-Laws and that nothing in this section be understood to delegate to the Board of Directors power to alter the procedure prescribed in these By-Laws for the election of officers. In connection with an interim or emergency action, the Board of Directors may secure a mail vote of the Council of Representatives.

6. The President of the Association shall be Chairman of the Board of Directors, and the Recording Secretary of the Association shall be Recording Secretary of the Board of Directors. The Executive Secretary of the Association and other employees may be invited to sit with the Board of Directors on appropriate occasions but shall have no vote.

ARTICLE IX

OFFICERS

1. The officers of the Association shall be as follows: a President, a President-Elect, a Recording Secretary, and a Treasurer. They shall hold office until their successors are elected and qualify.

2. The President shall be the Fellow of the Association who has just completed his term as President-Elect. The President-Elect shall automatically become President by declaration at the close of the annual meeting one year after announcement of his election as President-Elect. During his term of office the President shall serve as (a) general presiding officer of the Association, (b) Chairman of all meetings of the Council of Representatives, (c) Chairman of the Board of Directors. It shall be his duty to countersign all contracts and other instruments of the Association except checks, to exercise general supervision over the affairs of the Association and to perform all such other duties as are incident to his office or as may properly be required of him by vote of the Council of Representatives or Board of Directors at any duly constituted meeting. (In order to place these By-Laws into effect, the President shall be elected by preferential mail ballot prior to the first annual meeting by the members of the Association following primary nomination by mail ballot. He shall take office for a term extending from the beginning of the first annual meeting through the close of the next annual meeting. Thereafter the President-Elect shall become President according to the provisions of Section 2.)

3. The President-Elect shall be a Fellow of the Association, elected by preferential mail ballot by the members of the Association following primary nomination by mail ballot. He shall take office as President-Elect at the close of the annual meeting at which his election is announced. During his term of office as President-Elect he shall serve as (a) member of the Council of Representatives and Board of Directors, and (b) vice-chairman of the Council of Representatives and Board of Directors. In the event that the President shall not serve out his full term for any reason, the President-Elect shall

succeed to the unexpired remainder thereof and continue through his own term. In the event that the President-Elect shall not be able to serve out his term, both a President and a President-Elect shall be nominated and elected at the time of the next election. The duties of the President-Elect shall be those of a vice-president.

4. The Recording Secretary shall be a Fellow of the Association elected by the Council following nomination by the Board of Directors. He shall serve for a term of three years, beginning at the close of the annual business meeting at which his election is announced, and shall not succeed himself more than once in this office. During his term of office he shall serve as (a) member and secretary to the Council of Representatives, and (b) member and secretary of the Board of Directors. It shall be the duty of the Recording Secretary to keep the records of all meetings of the Council of Representatives and Board of Directors in due form as prescribed by law; to have charge of the seal and corporate books; to file and hold subject to call and to direct the publication of such records, reports and proceedings as are authorized by these By-Laws and by vote of the Council or Board of Directors at any duly constituted meeting; to bring to the attention of the Council and the Board of Directors such matters as he deems necessary; to conduct the official correspondence of the Association; to have custody of the bonds which are required to be filed by the Treasurer and such other fiduciary employees as shall be required by the Board of Directors to file a bond, holding these bonds subject to the order and direction of the Board of Directors; to issue calls and notices of meetings; to sign such checks or other drafts upon the funds of the Association as may be necessary in case of the death or incapacity of the Treasurer, and the Recording Secretary is hereby authorized to sign such checks or drafts in such contingency; to execute, seal or deliver any contracts, deeds, instruments or other documents which he shall be required to execute, seal or deliver on behalf of the association by the By-Laws, vote of the Council of Representatives or the Board of Directors; and in general to perform all such other duties as are incident to his office or as properly may be required of him by vote of the Council or Board of Directors at any duly constituted meeting. In the absence of any specific provision of these By-Laws to the contrary, the Recording Secretary shall have power and authority to represent the Association in the voting or other management of any stock held by the Association in any other corporation or company; and in the event that the performance of such acts by the Recording Secretary becomes impossible or inadvisable, by virtue of law or otherwise, the Recording Secretary shall have the power to appoint any member of the Association to act as duly authorized agent of the Association for the performance of said acts.

5. The Treasurer of the Association shall be a Fellow of the Association elected by the Council following nomination by the Board of Directors. The Treasurer shall take office for a term of five years beginning at the end of the fiscal year during which his election is announced, and shall not succeed himself more than once in this office. During his term of office he shall serve as (a) senior fiscal officer of the Association, (b) member and fiscal officer of the Council of Representatives and Board of Directors, (c) fiscal representative of the members of the Association to the Central Office and to the Advisory Board on Publications. It shall be the duty of the Treasurer to have custody of all funds, deeds, stocks, securities including those of the Association's publications and to deposit the same in the name of this Association in such bank or banks as the Council or Board of Directors may direct; to have custody of all other property of the Association not otherwise expressly provided for by these By-Laws and to hold same subject to the order and direction of the Council; to collect subscriptions and other debts due the Association by all persons whatsoever; and to execute, seal or deliver any contracts, deeds, instruments or other documents which he shall be directed to execute, seal or deliver on behalf of the Association by the By-Laws, vote of the Council or Board of Directors. He shall have authority to sign checks and drafts on behalf of the Association for the disbursement of

funds for the duly authorized purposes of the Association as provided by the By-Laws, vote of the Council or Board of Directors. He shall be bonded by any amount fixed by the Board of Directors, the bond to be filed with the Recording Secretary of the Association. He shall, at all reasonable times, exhibit his books and accounts to any member of the Association. He shall keep a full and complete record of all money received and all money paid out, and shall perform such other duties as reasonably may be required of him by vote of the Council of Representatives or Board of Directors at a duly constituted meeting. The Treasurer shall deliver an audited report for each fiscal year to the Board of Directors.

ARTICLE X

CORPORATE SEAL

1. The corporate seal of this Association shall be (here will be inserted a drawing of the corporate seal unchanged from that now in use).

ARTICLE XI

NOMINATIONS AND ELECTIONS

1. A call for nominations for the office of President-Elect and Regional Representative shall be issued by mail by the Election Committee to all members of the Association not later than March first of each calendar year. The nomination ballot shall provide spaces for at least three names to be listed in order of rank for each office to be filled. (Nominations for President shall be called for at the first selection only.)

2. The Election Committee shall be responsible for the reporting of nominations and elections. The Chairman of the Election Committee shall report a preferential count of the nominees for President-Elect and Regional Representatives to the Recording Secretary not later than May first. The names reported shall be those receiving a large number of nominating votes, the number of names reported being determined by the Election Committee, but being at least four nominees for President-Elect and at least two for each Regional Representative to be elected. (A count of nominations for President shall be provided at the first election only.) The Chairman of the Election Committee shall report at the same time nominations from the Divisions, as transmitted to the Election Committee by the secretaries of the Divisions. Such nominations shall include nominations for Representatives of the Division to the Council of Representatives, and at the request of the Division may include Divisional officers. Divisional Representatives who have served less than three years shall be renominated automatically and designated as incumbents on the ballot, but additional nominations shall be provided so that there shall be at least two names for every position to be filled.

3. It shall be the duty of the Election Committee to ascertain that all of the nominees for any office are willing to stand for office; if nominees are unwilling to stand for office their names shall not appear on the election ballot, and other nominees shall be substituted if necessary to secure at least four nominees for President-Elect and at least two nominees for each other position.

4. The Recording Secretary then shall issue through the Central Office the appropriate election ballots not later than June first to all members of the Association. Voting shall be by mail.

5. The Election Committee shall report to the Board of Directors a preferential count of the election ballots for the office of President-Elect and Regional Representatives not later than August first. The Election Committee shall secure reports from the secretaries of Divisions, and report their election results at the same time to the Board of Directors. Officers shall continue in office until the time provided in these By-Laws for their successors to assume office, provided the election of their successors has been reported to the

Board of Directors in accordance with the above provisions; in case the procedure is not followed for any office, the incumbent shall remain in office until his successor is elected and qualifies.

6. Announcement of elections shall be made by the Board of Directors at the annual business meeting of the Council, and at the annual convention at the session on Report of the Council.

ARTICLE XII

Policy and Planning Board

1. The Council of Representatives shall elect, not necessarily from its own members, a Policy and Planning Board of nine members of the Association, three of whom shall be elected each year, and each of whom shall serve for a term of three years. In the event of the incapacity or resignation of a member of this Board, the Council shall fill the vacancy for the unexpired term. (In order to place into effect, at the time of the first election, three members shall be elected for a term of one year, three for a term of two years, and three for a term of three years.)

2. The Policy and Planning Board shall represent all the active interests within the Association, so far as possible.

3. The Board's function shall be the consideration of current and long-range policy. As a continuing body, it shall recommend to the Council of Representatives such changes in existing policy and such extensions or restrictions of the functions of the Association or its Divisions as are consonant with the purposes of the Association. The Board shall report annually in writing to the Council and by publication to the entire membership of the Association. It may also make recommendations *ad interim* when it deems them desirable.

4. The Board shall elect a Chairman and Secretary annually from its own membership.

5. The Board shall meet at least once each year at the call of its Chairman or Secretary.

6. The Policy and Planning Board shall review the structure and function of the Association as a whole in 1950 and in every fifth year thereafter and shall make appropriate written report and recommendations to the Association.

ARTICLE XIII

Committees

1. The committees of the Association shall consist of such standing committees as may be provided by these By-Laws and such special committees as may be established by vote of the Council of Representatives or the Board of Directors.

2. The Committee on Committees shall consist of five members elected by the Council of Representatives for terms of five years. It shall be the duty of the Committee on Committees to keep informed on the committee structure of Divisions of the Association, in order to avoid duplication, and to make recommendations concerning the Association committee structure and personnel, the addition of new committees and the discontinuance of old committees. The formation of new committees by Divisions shall be subject to the approval of the Committee on Committees. Committees proposed by Divisions which appear to the Committee on Committees to deal with matters concerning two or more Divisions of the Association may be recommended as special committees of the Association, and may be appointed as such by the Council of Representatives. (In order to place into effect, at the first election, one member shall be elected for a term of one year, one for two years, one for three years, one for four years, and one for five years.)

3. The Finance Committee shall consist of the Treasurer and four members elected by the Council of Representatives. The Treasurer shall serve as Chairman. While the committee shall be elected annually, members may succeed themselves. It shall be the duty of the Finance Committee to present an annual budget, to supervise investments, and to nominate the professional auditors who shall be elected annually by the Council of Representatives.

4. The Convention Program Committee shall consist of three members elected by the Council of Representatives each for a term of three years. This committee shall each year add to its membership two members of the Association from the area or place at which the Annual Convention is to be held. It shall be the duty of the committee in conjunction with the Central Office to coordinate the Divisional programs and arrange for general scientific programs at the time of the Annual Convention. (In order to place into effect, at the first election one member shall be elected for a term of one year, one for two years, and one for three years.)

5. The Committee on Scientific and Professional Ethics shall consist of five members elected from different parts of the country for staggered terms of five years. Election to this committee shall be by vote of the Council of Representatives at its annual meeting on nomination by the Board of Directors. It shall be the duty of this committee to receive and investigate complaints of unethical conduct of Fellows, Associates, and Affiliates; to endeavor to settle cases privately; to report annually to the Council of Representatives on types of cases investigated with specific mention of difficult or recalcitrant cases; to recommend to the Council disciplinary action to be taken by the Association when in the Committee's judgment such action is justified and desirable; and to formulate from time to time rules or principles of ethics for adoption by the Association. (In order to place into effect, at the first election one member shall be elected for one year, one for two years, one for three years, one for four years and one for five years.)

6. The election Committee shall consist of the three most recently retired Presidents of the Association, the most recently retired President acting as Chairman of the Committee. In case of the incapacity of a member of this Committee, the next most recently retired President, who is not already a member of the Committee, shall become a member of the Committee. It shall be the duty of the Election Committee to conduct and supervise the mail elections as provided in Article XI of these By-Laws. (Until the system become established, the two most recently retired Presidents of the American Association for Applied Psychology who are members of the American Psychological Association, and the two most recently retired Presidents of the American Psychological Association shall function as the Election Committee, the most recently retired President of the American Psychological Association acting during the transitional year as Chairman; in the next year the Committee for the preceding year shall elect the Chairman from among those of its own membership who are to continue.)

7. The Committee on Student Affiliates shall consist of five members elected by the Council from different parts of the country for staggered terms of five years. It shall be the duty of this committee to represent the interests of the Student Affiliates, to encourage the organization of local groups, and to stimulate interest in the Association among those in training for the profession. This Committee shall add student representatives to its own membership. (In order to place into effect, at the first election one member shall be elected for a term of one year, one for two years, one for three years, one for four years, and one for five years.)

8. The Committee on Public Relations shall consist of three members elected by the Council for terms of three years. It shall be the duty of the committee to advise the Executive Secretary on matters pertaining to public relations. (In order to place into effect, at the first election one member shall be elected for a term of one year, one for two years, one for three years.)

9. The Committee on Publications shall be elected in accordance with the provisions of Article XVII, Section 4.

10. All committees appointed by the Association shall submit, three weeks in advance of the annual business meeting of the Council of Representatives, a report in writing to the Recording Secretary, in order that the Council may discuss and act upon recommendations arising out of such reports.

ARTICLE XIV

Affiliations and Branches of the Association

1. The Association shall encourage the organization of psychological societies and associations formed in accordance with general or special interests in psychology with geographical divisions of any size such as a region, a state or a city.

The Council of Representatives shall consider and provide means for aiding the activities of these local groups which tend to advance psychology as a profession. Means shall be devised for facilitating communication between affiliated societies and between these societies and the Council of Representatives.

2. Any association or society with aims similar to those of the American Psychological Association may petition the Council of Representatives for affiliation by submitting a statement describing its aims and purposes, together with copies of its By-Laws and lists of its officers and members. Upon the receipt of such a petition the Council of Representatives shall refer it to the Board of Directors for examination and recommendation, and shall act upon it at the next succeeding annual meeting. (All present geographical branches of the American Psychological Association, and all present affiliates of the American Psychological Association and of the American Association for Applied Psychology shall be granted affiliation with the American Psychological Association under the amended By-Laws, if they request it.)

3. The conditions under which affiliation shall be permitted are as follows:

a. The association shall assume no responsibility whatever for the administration or the financial affairs of affiliated organizations.

b. The responsibility for scientific programs rests with the affiliated organization except that, when meeting at the same time and place as the Association, the affiliated organization's program must be coordinated with that of the Association and its Divisions through the Convention Program Committee.

c. Each affiliated organization shall determine its own membership requirements and form of organization.

d. Each affiliated organization shall exercise such control over its membership that membership in the affiliated organization shall not imply membership status in the Association.

e. The Executive Secretary shall include in the Yearbook such information about the affiliated societies, their members and officers, as may be deemed appropriate.

4. In the event that the Council of Representatives believes that the conditions of affiliation are not being fulfilled by a given organization or that its affiliation is no longer to the best interest of the Association, the principal officers of the affiliated organization shall be so informed and the affiliation may thereafter be terminated by a two-thirds vote of the Council of Representatives.

5. The provisions of this Article shall apply to societies or clubs formed by student affiliates who are under the jurisdiction of the Committee on Student Affiliates (Article XIII, Section 7).

ARTICLE XV

AFFILIATIONS OF THE ASSOCIATION WITH OTHER ORGANIZATIONS

1. The Council of Representatives may establish affiliations with national and international scientific and professional organizations by two-thirds vote of those present at a regular meeting, may elect such representatives thereto as are necessary and proper, may authorize the payment of appropriate fees for such affiliation, and may terminate such affiliations when they are not in the interest of the Association.

2. The Board of Directors shall nominate to the Council of Representatives for representatives of the Association in the Division of Anthropology and Psychology of the National Research Council double the number of names required. These names shall then be voted upon by the Council of Representatives, and the requisite number of names of members receiving the highest number of votes shall be presented to the Division of Anthropology and Psychology of the National Research Council as the Association's nominees for its representatives.

3. The names of members submitted by the Executive Committee of the Social Science Research Council shall be voted upon by the Council of Representatives. The name of the Member receiving the highest number of votes shall be presented to the Social Science Research Council as the Association's nomination for its representative.

ARTICLE XVI

CENTRAL OFFICE

1. The Association shall maintain a Central Office for the promotion of the objectives of the Association and its Divisions. The functions of the Central Office shall include the administrative detail of the Association, the business management of publications, issuance of the yearbook, facilitation of personnel placement, promotion of public relations, and such other general and special services as are allocated to it by the Council of Representatives and the Board of Directors. Functions may be allocated to the Central Office by Divisions, provided they are consistent with these By-Laws. Details of arrangements between Divisions and the Central Office shall be cleared through the Board of Directors.

2. The Central Office shall be established at such a place and with such facilities as the Council of Representatives may direct.

3. The Association shall employ an Executive Secretary as the administrative agent of the Association and as managing director of the Central Office to work under the supervision of the Board of Directors. He shall be available to the officers and committees for professional consultation in connection with the affairs of the Association. He shall be employed for a term not to exceed five years, and shall ordinarily not be reappointed more than once. During his term as Executive Secretary he shall not hold any office within the Association or any of its Divisions.

4. The Board of Directors shall nominate a member of the Association to the Council for appointment as Executive Secretary. Election of the Executive Secretary shall be by a two-thirds vote of those present at a regular meeting of the Council. The Executive Secretary may be removed from office before the expiration of his term by a two-thirds vote of those present at a regular meeting of the Council of Representatives if it appears that the best interests of the Association are not being served by the incumbent.

5. A budget for the Central Office shall be recommended by the Finance Committee and approved by the Council of Representatives. The Executive Secretary may appoint such office personnel and acquire for the Association such office materials and equipment as the budget specifications warrant, except that appointments to his staff shall be approved by the Board of Directors.

6. The Executive Secretary shall report annually on the non-fiscal operations of the Central Office to the Council of Representatives through the Board of Directors. This report shall supplement the report on fiscal operations presented by the Treasurer. A summary of the report shall be presented to the Association, at the session of the annual convention devoted to Report of the Council, and published in the official journal of the Association.

ARTICLE XVII

PUBLICATIONS

1. Such records, reports, proceedings and journals containing scientific papers shall be published as are authorized by these By-Laws or by vote of the Council of Representatives at any duly constituted meeting. Among these shall be an official journal which shall contain discussion of professional problems, programs, reports, proceedings, announcements, presidential addresses, and such other official papers as the Council of Representatives may deem appropriate, and a journal which shall abstract the psychological literature and be known as *Psychological Abstracts*. Both of these shall be distributed to all members.

2. The Council of Representatives has the authority to acquire journals by purchase or deed of gift, and shall honor previous agreements contained in contracts or deeds of gift. With the approval of the Council of Representatives, Divisions may assign the business management of their own special journals to the Central Office. A Division may require its members to subscribe to its own special journal or journals.

3. The business management of the journals of the Association shall be the responsibility of the Board of Directors which shall submit a budget annually and shall report annually in writing to the Council of Representatives and to the membership on the financial status of the journals. The Board of Directors may delegate its responsibility for the management of the journals to the Central Office and to the Executive Secretary, who acting as Business Manager of Publications, shall be responsible for the annual preparation of the budget and financial report, and for the business details of the journals, in accordance with the policies outlined by the Board of Directors. He shall secure competitive bids for the printing of the journals and shall maintain accurate mailing lists of subscribers and shall be responsible for the storage and subsequent sale of back numbers.

4. The Council of Representatives shall elect a Committee on Publications, which shall consist of three members of the Board of Editors and three members of the Council who are not, at the time of election, editors of Association journals. The members of this committee shall serve for terms of three years, staggered so that one editor and one member of the Council is elected each year. (In order to place into effect, at the time of the first election, one editor and one Council representative shall be selected for a term of one year, one and one for two years, one and one for three years respectively.) Membership of the Council Representatives on the Committee on Publications may outlast membership on the Council of Representatives. It shall be the function of the Committee on Publications to make recommendations to the Council of Representatives through the Board of Directors on the management of journals, on the acquisition, initiation, or discontinuance of journals, and on the nomination of editors. The President and President-Elect shall be *ex officio* members of the Board during their terms of office. The senior representative of the Council of Representatives on the Committee shall act as chairman of the Committee. The Committee on Publications shall meet at least once each year prior to the annual business meeting of the Council. At this meeting the reports from the Board of Editors and the Business Manager shall be reviewed, recommendations with regard to the management of the journals prepared, and nominations for editorship made. At its discretion the Committee may invite representatives of any of the publications of the As-

sociation or of the Divisions of the Association to be present to consider common problems.

5. The Board of Editors shall consist of the editors of the journals of the Association. It shall be the duty of the Board of Editors to outline general editorial policy, and to supervise the editorial conduct of the journals. The Board shall select its chairman annually. The Board shall have power to draw up rules and regulations for the conduct of its own meetings, for the guidance of editors, for the selection of assistant and associate editors, and for the submission of manuscripts. The Board shall prepare an annual report in writing on the editorial conduct of the journals which shall include a summary of the number of manuscripts received, accepted, and rejected.

6. Editors of Association journals shall be elected for a term of six years, one or two editors retiring at the end of each calendar year. (The present editors of Association journals shall continue for the remainder of their existing terms at the time of the adoption of these By-Laws.) Editors may be re-elected for one term only, except in the case of *Psychological Abstracts,* where a longer period of service may be authorized by vote of the Council of Representatives. Election shall be by the Council of Representatives upon receipt from the Committee on Publications of at least two nominations for each vacancy. Editors shall normally be elected one year prior to their taking office as editor. In the case of the disability or resignation of any editor, the Board of Editors through its chairman shall be responsible for the editorial conduct of the journal concerned, until a successor is duly elected to fill the unexpired term by a mail vote of the Council of Representatives upon the recommendation by the Committee on Publications of at least two names for the vacancy. By two-thirds vote of those present at an annual business meeting, the Council of Representatives may terminate an editor's term before its normal expiration. It shall be the duty of each editor to conduct his journal in conformity with the general policies outlined by the Board of Editors. The decision of an individual editor as to the selection or rejection of manuscripts submitted to him shall be final. Once each year, each editor shall submit to the Committee on Publications a written report concerning the state of the journal which he edits.

ARTICLE XVIII

Annual Convention

1. There shall be an annual convention of the Association at a time and place to be determined by the Council of Representatives. (The time and place of the first annual meeting shall be determined by enabling action of the national societies concerned therewith.) Announcement of time and place of the annual convention shall be made by the Council of Representatives one year and plans shall be made at least two years in advance thereof.

2. All Divisions of the Association and affiliated societies may arrange programs at the annual convention.

3. The Central Office shall provide such counsel and material assistance to the Division Program Committees and to the Convention Program Committee as may be requested and as seems to the Executive Secretary and the Board of Directors to be most effectively and economically provided by the office without prejudice to the best interests of the Divisions and the Association.

4. In lieu of an annual business meeting of members, the Convention Program Committee shall provide for a session at the annual convention on Report of the Council with the President of the Association presiding, such session not to conflict with other major program interests. At this session, the Council of Representatives shall submit a summary report of its business for the year, including summary reports from the Treasurer, the Board of Directors, and the Executive Secretary.

ARTICLE XIX

SUBSCRIPTIONS

1. The annual subscription to be paid by Fellows, Associates, Student Affiliates, and Division Affiliates shall be determined by the Council of Representatives. (The annual subscription for the first year*: for Charter Fellows shall be Fifteen Dollars per year; for Charter Associates, Ten Dollars per year; for Student Affiliates Five Dollars per year; and for Division Affiliates, Two Dollars per year.)

2. Subscriptions of Fellows, Associates, and Student Affiliates shall entitle them to the official journal of the Association, to *Psychological Abstracts* and to the Yearbook.

3. The annual subscription of Division Affiliates (non-members of the Association) shall be set by the Council of Representatives, over and above such fees as the Division may require. For this subscription, Division Affiliates shall receive the official journal and the Yearbook.

4. There shall be made available to each Division to which an Associate or Fellow belongs, One Dollar from his subscription for the specific use of that Division. For the use of the first Division to which the member belongs, this sum shall be made available from the general subscription; for each additional Division, One Dollar shall be collected from the member in addition to the general subscription, and made available to this Division for its use. A Division may require additional subscriptions of its own members.

5. The Central Office shall act as the collection agency for the Divisions. All unexpended funds at the end of the fiscal year allocated to Divisions from Association subscriptions shall revert to the treasury of the Association. This shall not apply to any special subscriptions made in the name of the Division, and specified as non-reverting.

ARTICLE XX

AMENDMENTS

1. The Association, by mail vote of the members on the official rolls of the Association at the time of mailing, may adopt such By-Laws or amendments to By-Laws as it deems necessary for the management of the affairs of the Association, the prescription of the duties of officers, committees and employees, and for the conduct of all kinds of business within the objects and purposes of the Association. Amendments may be proposed by the Council of Representatives on its own initiative; or as the result of recommendations from the Policy and Planning Board; or from the Board of Directors, when approved by the Council of Representatives by a majority vote; or on petition signed by 200 members of the Association. A copy of each amendment proposed, with space appropriate for voting and such explanations of the amendment as the Council of Representatives deems necessary, shall be mailed to the last recorded address of each member. Sixty days after date of mailing, the ballot shall be closed and the votes counted by the Election Committee, which shall certify the result to the Council of Representatives at its next annual meeting, at which time the amendment, if passed by two-thirds of all the members voting, shall go into effect.

ENABLING ACTION

The Joint Committee has transmitted to the Board of Governors of the AAAP and to the Council of Directors of the APA suggestions for enabling action and suggested provisions for the transitional year, in case these By-Laws are favorably acted upon.

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* It is estimated that $40,000 per year will be needed to provide the services of the new Association.

EXHIBIT B

LETTER FROM CHARLES H. BRADLEY

May 17, 1944

Mr. E. R. Hilgard,
War Production Board,
Room 2411, Social Security Building,
Washington 25, D. C.

Dear Mr. Hilgard:

I have considered the plan for affiliation of various psychological associations and societies within the framework of the American Psychological Association under proposed amended By-Laws. The fundamental legal question is of course whether the APA has the requisite powers. It is a corporation of the District of Columbia and can only do what it is authorized to do under the laws of that jurisdiction, its Certificate of Incorporation and its present or amended By-Laws. Its authority to act as a corporation is limited to the District of Columbia, except such privileges and rights as are extended to it under the general laws of the several states where it might wish to operate.

The APA was incorporated under a general law which authorizes three or more persons to associate themselves and form a corporation for various purposes including scientific. The Certificate of Incorporation recites that the signers desired to associate themselves for scientific purposes, and that the object of the society is "to advance psychology as a science." In Article I of the proposed By-Laws it is stated that the objects of the Association "shall be to advance psychology as a science, as a profession, and as a means of promoting human welfare." The incorporation for scientific purposes, and the stated purpose "to advance psychology as a science" are in my opinion sufficiently broad to include the additional general purposes stated in the proposed By-Laws. It is not necessary to amend the Certificate of Incorporation.

The proposed By-Laws have been carefully considered, discussed with you, and some changes have been made in the draft submitted. The APA would, in my opinion, be authorized under its Certificate of Incorporation and the laws of the District of Columbia to operate under them.

The APA must be operated by and be under the control of its membership. This will be accomplished under the proposed By-Laws by the requirement that representatives on the Council of the regions, divisions, and special groups, be members or associates of and elected by members of the APA. If there were a possibility of a majority of the representatives on the Council being elected by a minority of the total membership of the association, some change should be made in the proposed By-Laws to prevent control by a minority. It is understood however that it is highly improbable that such a situation could arise.

In the Chapter of the District of Columbia Code under which the Association was incorporated, is a section which, insofar as applicable, reads as follows:

> Such incorporated society may elect its trustees, directors, or managers at such time and place and in such manner as may be specified in its by-laws, who shall have the control and management of the affairs and funds of the society, and a majority of whom shall be a quorum for the transaction of business, and whenever any vacancy shall happen in such board of trustees, directors, or managers the vacancies shall be filled in such manner as shall be provided by the by-laws of the society: . . .

Under the proposed By-Laws the Council of Representatives would be the governing body, would be the association's managers, and would have control and custody of its affairs and funds. The Council will consist of a rather large number of persons which might make its actions as the governing body somewhat cumbersome. However, the powers given the Board of Directors under the proposed amended By-Laws, and such others as are delegated by the Council, should enable the Board to efficiently carry on the business of the Association between meetings of the Council.

The proposed By-Laws should be approved by the AAAP and any other associations which are to become affiliated with the APA before they are adopted by the latter.

The present By-Laws provide in Article XII that at any annual meeting By-Laws may be adopted or amended by vote of two-thirds of the members present. This language is very clear, but because of the substitution of the amended By-Laws, the proposed increase in activities of the APA, and the difficulties which there will undoubtedly be in attendance of members at the annual meeting, it would be advisable, as is apparently contemplated, to obtain by mail from the members their consent or dissent to the adoption of the proposed By-Laws. While these written consents or objections could not be counted as votes at the meeting, unless there were a By-Law provision authorizing it, they would be indicative of the wishes of the absent members and could and should be considered in any action taken by the members present. Such consents as were obtained would estop those giving them from later complaining of actions taken in accord therewith. Should a majority, or even a large percentage of the total membership not present at the meeting, indicate disapproval of proposed action, it would appear inadvisable that such action be taken by the members present at the meeting.

The actions taken by the AAAP and any other interested association for approval of the proposed By-Laws and to effect affiliation with the APA thereunder must be in accord with their charters (if any), By-Laws, and applicable State laws.

Affiliation of the American Association for Applied Psychology, a corporation, is to be affected by its Associates and Fellows being invited to become respectively associates and members of the APA under an amendment to the latter's By-Laws to become effective in September, 1944. It is understood that the only other corporation involved is the Psychometric Corporation which publishes the journal of the Psychometric Society, the latter to be a charter division of the APA.

Whatever action is taken by the AAAP and the Psychometric Corporation must, of course, be determined by their respective members under their charters, By-Laws, and the laws of their respective domiciles. They could doubtless sell and transfer their assets to the APA which, under appropriate corporate action, could acquire them. It is understood that the chief assets of these other two corporations are their journals. If the APA acquired these journals and continued their publication they would have to be published as journals of the APA under appropriate titles.

If the proposed plan is carried out it would appear preferable for these other corporations to dispose of their assets, wind up their affairs and dissolve. If the assets are sold to others than the APA, the journals doubtless should not be included but discontinued. If such action is taken care should be exercised to insure that it is in conformance with the laws of each corporation's domicile. If those corporations retained their assets and continued in existence it would not be advisable for the APA to publish the journals of those corporations under contracts with them. The APA might be considered as engaging in a publishing business which it would not be authorized to do.

Under the present plan the proposed amended By-Laws of the APA are to be adopted in September, 1944, to become effective a year later. A proposed plan of procedure during the intervening year, including adoption of certain amendments of the existing By-Laws to become effective in September, 1944, have been considered and discussed with you. Certain changes were made therein and the present plan would doubtless prove satisfactory.

The American Psychological Association is exempt from Federal and District of

Columbia income taxes and Federal Employment taxes. The provision in each of these laws is almost identical and exempts organizations operated exclusive for religious, charitable, scientific, literary or educational purposes, no part of the net earning of which inures to the benefit of any private shareholder or individual. If the proposed By-Laws are adopted and the APA operates under them it would still come within the exemption.

Sincerely yours,
CHARLES H. BRADLEY

EXHIBIT C

PROPOSED MAIL VOTE FOR THE AMERICAN ASSOCIATION OF APPLIED PSYCHOLOGY

The following mail votes are proposed:

1. It is hereby recommended that the American Association for Applied Psychology go on record as approving the proposed amended By-Laws of the American Psychological Association, as attached.

In the event that the American Psychological Association adopts these amended By-Laws, it is understood that the functions now performed within the American Assocation for Applied Psychology will be performed within the American Psychological Association, and steps will be taken for the dissolution of the American Association for Applied Psychology as now constituted.

The activities of the American Association for Applied Psychology will in any case continue for the year 1944–1945, its regularly elected officers, committees, editors, continuing to exercise their duties during that year under the existing By-Laws of the American Association for Applied Psychology.

——— I vote in favor of the above proposition
——— I vote against the above proposition

2. Vote for one of the following:

——— a. If two-thirds of the members voting on this ballot are favorable to adoption of the amended By-Laws, I vote in favor of action at the business meeting in September, 1944, even though the meeting is small provided, of course, that a quorum is present.

——— b. Regardless of the results of the present mail vote, I vote in favor of postponing final action until the first regular meeting of the Association after the termination of the war.

Check one:
——— Associate
——— Fellow

PROPOSED MAIL VOTE FOR THE AMERICAN PSYCHOLOGICAL ASSOCIATION

The following mail votes are proposed:

1. It is hereby recommended that the By-Laws of the American Psychological Association be amended according to the proposal attached.

It is understood that the American Psychological Association will not take final action in adopting these amended By-Laws unless they have been approved by the American Association for Applied Psychology.

——— I vote in favor of the above proposition
——— I vote against the above proposition

2. Vote for one of the following:

——— a. If two-thirds of the Members voting on this ballot and two-thirds of the Associates voting on this ballot are favorable to adoption of the amended

By-Laws, I vote in favor of action at the business meeting in September, 1944, even though the meeting is small provided, of course, that a quorum is present.

——— b. Regardless of the results of the present mail vote, I vote in favor of postponing final action until the first regular meeting of the Association after the termination of the war.

Check one:

——— Associate
——— Member

EXHIBIT D

Proposed Vote for September Meeting of the AAAP

Moved that, in view of the wishes of the membership as expressed in the mail ballot, the American Association for Applied Psychology recommend to the American Psychological Association that it amend its By-Laws in accordance with the attached proposal.

Since further steps cannot be taken appropriately by the American Association for Applied Psychology until the American Psychological Association has acted, it is proposed that this business meeting be reconvened following the APA business meeting.*

EXHIBIT E

Proposed Vote for September Meeting of APA

Moved that the By-Laws as printed in the 1944 Yearbook, together with such amendments as may be voted for the year 1944–1945**, be rescinded as of the date of the annual meeting in September 1945;

that the amended By-Laws as approved by mail and as presented at this meeting be adopted to be effective at the date of the annual meeting in September 1945;

that following termination of reports from officers and committees and other old business at the annual meeting of September 1945, the presiding officer shall declare the amended By-Laws to be in effect and shall call for a motion adjourning the annual meeting of members. At the termination of this meeting, the Council of Representatives elected in 1945 shall convene under the newly elected President and assume their duties under the amended By-Laws. The Secretary and Treasurer shall continue to serve until their successors are elected and qualify.†

PROVISIONS FOR THE TRANSITIONAL YEAR 1944–1945 A REPORT OF THE COMMITTEE ON THE CONSTITUTION††

Introductory Note: The general principle is accepted that both the American Psychological Association and the American Association for Applied Psychology will continue to operate during 1944–1945 much as they have during 1943–1944.

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* In case the APA adopts the amended By-Laws, steps will be taken to smooth the transition to the new organization, and to terminate the AAAP organizational structure.

** In case the motion as stated is passed, amendments will be offered, calling for elections during the transitional year to provide a new Council of Representatives and new Officers to be ready to serve when the amended By-Laws are in effect.

† The provision is necessary for these officers whose successors remain to be chosen by the newly elected Council of Representatives. The previous officers must serve until they can turn over their books to appropriate new officers.

†† The report has been edited to contain the corrections and additions made at the Annual meeting.

The changes proposed below assume favorable action by both societies on the proposals. The changes make possible an election within the APA in the spring of 1945 which will provide officers and members of the Council of Representatives appropriate to the amended By-Laws which would then become effective in September 1945.

CHANGES IN EXISTING AMERICAN PSYCHOLOGICAL ASSOCIATION BY-LAWS FOR THE TRANSITIONAL YEAR 1944–1945

Article I, Section 3

Delete: "An Associate shall not be entitled to vote, or to hold office or to any other privileges of Members except those specifically provided for."*

Substitute: "An Associate shall be entitled to vote and to all other rights and privileges of the Association except those herein restricted."

Article I, Section 12

During the year 1944–1945, Associates of the American Association for Applied Psychology not at the time belonging to the American Psychological Association shall be invited to become Associates of the American Psychological Association, and shall be accepted as Associates upon payment of the annual subscription without following the election procedure of Sections 5, 8, and 9.**†

Article I, Section 13

During the year 1944–1945, Fellows of the American Association for Applied Psychology who are at the time either Associates or non-members of the American Psychological Association, shall be invited to become Members of the American Psychological Association, and shall be accepted as Members upon payment of the annual subscription without following the election procedure of Sections 5, 6, 7, 8, 9, and 10.

Article VI, Section 1

Delete the present Section 1, beginning "At least five months before the date set for the Annual Meeting, the Election Committee, . . . " and ending " . . . to be designated by the Council by standing regulation."

Incorporate the new Section 1 below, parts a, b, c, d.

Section 1, Part a. Call for Nominations

A call for nomination for the office of President and President-Elect and for Regional Representatives shall be issued by mail to all Associates and Members of the Association not later than March 1, 1945. Voting shall be by mail. Only Members of the Association shall be eligible for President or President-Elect, but Associates may be eligible as Regional Representatives. The nomination ballot shall provide spaces for at least three names to be listed in order of rank for each office to be filled.

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* This is necessary in order to provide the voting privileges called for under the amended By-Laws.

** This provides a mechanism for adding members after the annual meeting, before the elections in the spring of 1945.

† At the time the amended By-Laws come into effect, the Charter Associates and Charter Fellows will be those described in the amended By-Laws. The Council of Representatives elected in the spring of 1945 will represent these Charter Associates and Fellows through the membership provisions of Sections 12 and 13. The payment of subscriptions to both the APA and the AAAP is in lieu of the increased subscription to be called for under the amended By-Laws.

Section 1, Part b. Regional Representatives

The following nominations are to be made for Regional Representatives:

Region I. New England. Nominations by Associates and Members resident at the time of nomination in Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont, for one representative to be elected for a term of one year.

Region II. Middle Atlantic. Nominations by Associates and Members resident at the time of nomination in Delaware, District of Columbia, Maryland, New Jersey, New York, Pennsylvania, for one representative to be elected for a term of two years.

Region III. East North Central. Nominations by Associates and Members resident at the time of nomination in Illinois, Indiana, Michigan, Ohio, West Virginia, Wisconsin, for one representative to be elected for a term of three years.

Region IV. West North Central. Nominations by Associates and Members resident at the time of nomination in Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, for one representative to be elected for a term of one year.

Region V. Southeastern. Nominations by Associates and Members resident at the time of nomination in Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, for one representative to be elected for a term of two years.

Region VI. Southwestern. Nominations by Associates and Members resident at the time of nomination in Arizona, Arkansas, Louisiana, New Mexico, Oklahoma, Texas, for one representative to be elected for a term of three years.

Region VII. Rocky Mountain. Nominations by Associates and Members resident at the time of nomination in Colorado, Idaho, Montana, Wyoming, Utah, for one representative to be elected for a term of one year.

Region VIII. Pacific. Nominations by Associates and Members resident in California Hawaii, Nevada, Oregon, Washington, for one representative to be elected for a term of two years.

Region IX. Dominion of Canada. Nominations by Associates and Members resident in Canada for one representative to be elected for a term of three years.

Section 1, Part c. Representatives of Charter Divisions

There shall be appointed by the Council of Directors, following the annual meeting in September, 1944, a Division Organization Committee, consisting of six members of the Association, three of whom shall also be members of the American Association for Applied Psychology.

The Division Organization Committee shall name a temporary chairman and a temporary secretary for each of the Charter Divisions proposed in Article VII of the amended By-Laws, except that for the two divisions continuing existing societies (Psychometric Society; Society for the Psychological Study of Social Issues) and for the five divisions continuing the sections of the American Association for Applied Psychology (Division of Clinical Psychology; Division of Consulting Psychology; Division of Industrial and Business Psychology; Division of Educational Psychology; Division of Military Psychology) the president (or chairman) and secretary of each of the societies and divisions named shall be appointed as temporary officers of the new Charter Divisions provided they are Associates or Members of the American Psychological Association, or become such under the provisions of Article I as amended.

The temporary officers shall be charged with making such arrangements as necessary to facilitate the nominations and elections of divisional representatives and divisional officers in the elections of 1945, and with making arrangements for organizational meetings of the divisions at the time of the Annual Convention under the amended By-Laws in September 1945.

Each of the temporary secretaries shall be charged specifically with furnishing to the Secretary of the American Psychological Association not later than February 15, 1945 a list of divisional offices for which nominations shall be called for in the general nomination. Names may be recommended for inclusion on the nomination ballot at the discretion of the temporary divisional officers, but spaces shall be provided for additional nominations by the membership.

Nomination and voting in the election of 1945 shall be by mail by all those who are Associates or Members of the American Psychological Association, according to the provisions of Article I as amended. At the time of the nominations, each Associate or Member shall declare his intention to join one or more of the Divisions as listed in Article VII of the amended By-Laws. He may offer nominations and vote in as many divisions as he intends to join, except that only those already members of the societies may vote in those Divisions continuing the Psychometric Society and the Society for the Psychological Study of Social Issues, and only those already members of the sections of the American Association for Applied Psychology may offer nominations and vote in the five divisions continuing those sections.*

The Election Committee shall be responsible for the reporting of nominations and elections. The Chairman of the Election Committee shall report a preferential count of the nominees for President, President-Elect, and Regional Representatives to the Secretary not later than May 1, 1945. At the same time, he shall report to the Secretary the count of nominees for the Charter Divisions, as transmitted to the Election Committee by the secretaries of the divisions.**

It shall be the duty of the Election Committee to ascertain that all nominees for any office are willing to stand for office; if nominees are unwilling to stand for office, their names shall not appear on the election ballot, and other nominees shall be substituted if necessary to secure at least four nominees for President and President-Elect and at least two nominees for each other position.

Section 1, Part d. Election Procedure

On the basis of the nominations reported by the Election Committee, the Secretary shall issue appropriate election ballots not later than June 1, 1945 to all Associates and Members of the Association. Voting shall be by mail, and ballots shall be returned to the Chairman of the Election Committee.

The Election Committee shall report to the Secretary a preferential count of the election ballots for the office of President, President-Elect, and Regional Representatives not later than August 1, 1945. At the same time, reports shall be made on the election of Charter Division officers, including reports obtained from those Charter Divisions which have not assigned ballot counting to the Election Committee.

Article VII, Section 4

Delete present Section 4. Substitute the following.

During the year 1944–1945 the Election Committee shall consist of the President of the American Psychological Association retiring from office in September 1944, as chairman; the next most recently retired President of the Association; the two most recently retired Presidents of the American Psychological Association for Applied Psychology who are members of the American Psychological Association. It shall be the duty of the Election Committee to conduct and supervise the mail elections of the Association as provided in Article VI of these By-Laws, as amended.

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* Intention to join is accepted as the equivalent of membership in the absence of divisional requirements or dues payments. Divisional membership requirements will be set at the time of the Annual Convention in September 1945.

** In the case of new divisions with temporary secretaries, responsibility may be delegated to the Election Committee by the Division Organization Committee.

Article XII, Amendments

Delete the present section and substitute the following:

Amendments to the new By-Laws may be proposed by the Committee on the Constitution and submitted to the membership by mail. If two-thirds of the Members and Associates casting a ballot vote favorably the amendments will be in effect at the same time as the new By-Laws in September 1945 provided that at least 50 Members have voted.

REPORT OF THE ELECTION COMMITTEE OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION ON THE POLL ON THE REVISION OF BY-LAWS, AUGUST 21, 1944

To the Council of Directors and Members of the American Psychological Association:

1. *Number of Validated Ballots Received:*
   From Members: 445, or 52% of the 858 Members eligible.
   From Associates: 1138, or 31% of the 3806 Associates eligible.
   (One ballot from a Member and three from Associates which lacked signatures on the validating slips and identification on the outer envelope were not counted.)

2. *Summary of Vote*

   I. "It is hereby recommended that the By-Laws of the APA be amended according to the proposal attached. It is understood that the APA will not take final action in adopting these amended By-Laws unless they have been approved by the AAAP."

	For	*Against*	*No Vote*	*Total*
Members	324	103	18	445
Associates	973	143	22	1138

   II. a. "If two-thirds of the Members voting on this ballot and two-thirds of the Associates voting on this ballot are favorable to adoption of the amended By-Laws, I vote in favor of action at the business meeting in September, 1944, even though the meeting is small, provided, of course, that a quorum is present. (If a quorum is not present this will be interpreted to mean action at the first annual or special meeting at which a quorum is present)."

   b. "Regardless of the results of the present mail vote, I vote in favor of postponing final action until the first regular meeting of the Association after the termination of the war."

	IIa	*IIb*	*No Vote*	*Total*
Members	247	190	8	445
Associates	793	325	20	1138

3. *Analysis and Detail of Vote*

Table 1. Vote of Members

	PROPOSITION I To Amend By-Laws			PROPOSITION II TOTALS		
	For	*Against*	*No Vote*	*Totals*	*% Total Vote*	*% Voters Eligible*
PROPOSITION II						
a. To act at 1944 Meeting	241	3	3	*247*	55%	29%
b. To postpone action	77	98	15	*190*	43%	22%
No vote on II	6	2	—	8	2%	1%
PROPOSITION I, TOTALS	*324*	*103*	*18*	*445*	100%	52%
Proportion total vote cast	73%	23%	4%	100%		
Proportion 858 Members, eligible	38%	12%	2%	52%		

Table 2. Vote of Associates

	PROPOSITION I To Amend By-Laws			PROPOSITION II TOTALS		
	For	*Against*	*No Vote*	*Totals*	*% Total Vote*	*% Voters Eligible*
PROPOSITION II						
a. To act at 1944 Meeting	779	8	6	*793*	70%	21%
b. To postpone action	178	133	14	*325*	28%	9%
No Vote on II	16	2	2	20	2%	1%
PROPOSITION I, TOTALS	*973*	*143*	*22*	*1138*	100%	31%
Proportion total vote cast	85%	13%	2%	100%		
Proportion 3806 Associates eligible	26%	4%	1%	31%		

Respectfully submitted,
HERBERT WOODROW
CALVIN P. STONE
JOHN E. ANDERSON, *Chairman*

REPORT OF THE REPRESENTATIVE ON THE AMERICAN DOCUMENTATION INSTITUTE

To the Council of Directors and Members of the American Psychological Association:

During 1943 the American Documentation Institute continued the services and projects previously undertaken by its various activities. These included the operation of the auxiliary publication service; provision of sets of journals in microfilm; cooperation with the United States Department of Agriculture in supplying equipment used in operating Bibliofilm Service; and the continuation of the Oriental Literature Service.

An extension of the auxiliary publication service to make the American Documentation Institute the depository of translations that various individuals or organizations wish to make generally available is in the process of being inaugurated. This has been undertaken with the cooperation of the Office of the Alien Property Custodian. A list of the documents deposited and available, arranged by subject classification, is being compiled for publication.

Due to operation on a restricted basis with part-time or volunteer staff, costs have been kept at a minimum, and ADI financial resources are slightly higher than last year. The address of the American Documentation Institute is: Science Service Building, 1719 N St. N. W., Washington, D. C.

Respectfully submitted,
STEUART HENDERSON BRITT

REPORT OF THE DELEGATES TO THE INTER-SOCIETY COLOR COUNCIL

To the Council of Directors and Members of the American Psychological Association:

The Annual Meeting of the Inter-Society Color Council was held March 1, 1944 at the Hotel Pennsylvania in New York City. It opened with a discussion on *Small Color Differences*, in which problems relating to textiles and paint, and a summary of information on the expression of small color differences were presented by delegates from several Member Bodies. The session was co-sponsored by the American Association of Textile Colorists and Chemists and the Federation of Paint and Varnish Production Clubs. A stenographic report of this meeting was taken and will be published.

The retiring chairmen, Dr. Dean B. Judd of the National Bureau of Standards presented the following report of the activities of the ISCC during the preceding year.

The year 1943 marked the return of the Council's annual meeting to an Association with the winter meeting of the Optical Society of America. As in former years this association proved to be most happy. The subject of the Technical Session, which was formally arranged by the Council for the OSA program, was Color Blindness and Color Blindness Tests. The majority of the papers of this session have been published in the Journal of the Optical Society, and it is anticipated that they will be put under a single cover and mailed to Council delegates and members within a few weeks.

Our Discussion Session last year was marked by a very lively exchange of views on Color Harmony with delegates of the American Artists Professional League presenting most ably the artists' view. This continued willingness of the artist to exchange views is most gratifying and valuable; and it is to be hoped that we will hear more from them this year through their chairman, Mr. Conrow, who this year becomes a member of our Executive Committee.

Our News Letter Editor, Dr. Godlove, has continued to improve our bi-monthly periodical, and as usual, deserves our best thanks for a good job well done under considerable time pressure. He has been materially assisted by our Secretary, Miss Nickerson.

Committee work has necessarily been limited to projects useful to the war effort. The Color Aptitude Test Committee has completed its study of the preliminary material, and has written the specifications for a new and improved test under the co-chairmanship of Mr. Foss and Dr. Dimmick. A committee on ways and means to produce a supply of material adequate for trials of the new test has actually produced this material. This committee consisted of Messrs. Foss, Granville, and Macbeth. A very convincing vote of confidence in the Council's color-aptitude-test work was received from Cheney Brothers and took the form of a check for a substantial sum toward reimbursing members of the committee for their expenses in development of the test.

The subcommittee on color blindness has extended its interests to include not only the single-judgment form of red-green discrimination tests requested by the Navy Department, but also an anomaloscope form of test and a form of pseudo-isochromatic charts which it is believed can be made cheat-proof.

Finally, some much-needed technical work relating to the specification of color tolerances has been encouraged by the chairman of our program committee, Miss Nickerson, who arranged the 1944 discussion session co-sponsored by two of our member bodies. The American Association of Textile Chemists & Colorists and the Federation of Paint and Varnish Production Clubs.

The new chairman for the period 1944–45 is Dr. Michael J. Zigler of the APA Delegation. Other delegates are also active in the work of the council, even though many of them continue to be absorbed in the war effort.

At a recent meeting of the Executive Committee there was brought up for consideration a re-statement of the organization and functions of the ISCC. This has become desirable because of the increase in membership and the expanded activities of the council. The Executive Committee expects to present the statement with related resolutions to the next Annual Meeting and to the Member Bodies for their information and action.

Plans have been inaugurated for the 1945 annual meeting, and will be given out in the late fall.

Your delegation recommends that the APA continue its affiliation with the Inter-Society Color Council and that the present delegation be re-elected.

Respectfully submitted,

JOY P. GUILFORD	FORREST LEE DIMMICK, *Chairman*
HARRY NELSON	SIDNEY M. NEWHALL, *Voting Delegate*
THEODORE F. KARWOSKI	MICHAEL J. ZIGLER, *Voting Delegate*
ELSIE MURRAY	FRANK A. GELDARD
LOUISE L. SLOAN	CLARENCE H. GRAHAM

REPORT OF THE REPRESENTATIVE TO THE DIVISION OF PERSONNEL OF THE NATIONAL COMMITTEE FOR MENTAL HYGIENE, JULY 1, 1944

To the Council of Directors and Members of the American Psychological Association:

Last month the Division of Personnel of The National Committee for Mental Hygiene completed its fifth year of service in rendering assistance to clinics, hospitals, and welfare and educational agencies, in finding adequately trained personnel in the fields of psychiatry, psychology and psychiatric social work. Shortly after Dr. George S. Stevenson, the Medical Director of the National Committee, assumed office in 1939, he reported on our personnel activities, saying:

> There is no activity of The National Committee for Mental Hygiene that forwards its aims, insures its national scope, or secures good will, so effectively as helping to find the right people for mental hygiene positions and making the right appointments for those who have been trained well for our field. In getting the right person into a mental hygiene position we are not only saving much time and worry later in giving advice and counsel about problems, but are insured of the continuous advancement of our field through critical experiments and scientific work in day by day work in clinics, hospitals and other mental hygiene agencies. In setting up such a service a clear distinction is to be made from an employment agency. Our primary responsibility is the conservation of

mental health of the people. We have only a secondary responsibility to the professional person.

During the period since our last report eighty-four people have sought our aid in finding clinical positions in psychology. Many of them were young people recently graduated from college, without adequate training; others were well qualified in their chosen field. Twenty-five of this group claimed membership in the APA.

As Dr. C. M. Louttit pointed out in his presidential address presented at the 1943 meeting of the AAAP, "One of the major issues to which professional attention must be directed is that of training in psychology." In guiding these younger workers, it has been helpful to be able to refer them to the recommendations made jointly by the New York City Committee on Mental Hygiene and the Mental Hygiene Section of the Welfare Council of New York City, in a study *Standards of Training of Professional Personnel in Psychiatric Clinics*, in which the experience of the clinical psychologist is described as being

> not only the ability to make appropriate application of tests in a variety of situations, but also the ability to interpret results in the light of other available medical, psychiatric, social and educational data. It also signifies a knowledge of various therapeutic techniques and it calls for an ability to use remedial measures and methods in education and to make personality evaluations and appraisals of attitudes. This experience should include that actually acquired through working with patients in both diagnostic and treatment situations.

Likewise, the *Report of the Committee on Clinical Training of Psychologists* (Amer. J. Orthopsychiat. 1940, **10**, 166–71) has directed psychologists in obtaining further training.

In urging adequate training, we have in each instance pointed out to these youthful workers the desirability of serving a clinical internship under the supervision of a clinical psychologist in an organization using the services of psychiatrist, psychologist and psychiatric social worker. The latter committee believes that an essential part of the clinical training of a psychologist is association with psychiatrist and psychiatric social worker; that a proper clinical point of view cannot be obtained without these contacts; and further that students with clinical training have a broader point of view and do more constructive work than students not so trained. Dr. Simon H. Tulchin* has explained,

> Such an internship will not only equip the student with many specific and general skills but will also help him gain experience in interviewing people in order to gain specific information; it will teach him to observe behavior, and to be able to discuss with adequacy his own findings and understand the findings of his colleagues.

In this counselling service, it has been a handicap not to be able to suggest a larger number of training centers where such internships are available and where training in this field might be obtained. We are aware of the excellent work being done under the direction of Dr. Elaine Kinder, Dr. Emily Burr, Dr. Carney Landis, Dr. Esther Whitman, Dr. Gladys Tallman, and one or two other leaders. It would be appreciated if APA members learning of this need in our guidance work and knowing of such training centers, would advise us as to their names and addresses.

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* Publication No. 9. AAAS. pp. 389–395.

In this report emphasis has been placed purposely upon the training of the clinical psychologist. Invariably, the recent university graduates, coming to the Division of Personnel for assistance, have indicated their confusion in not knowing where to turn for guidance in obtaining adequate training, and at the end of an interview have expressed their satisfaction for the information that our Division has been able to impart. However, our Division believes that undoubtedly there is a great deal more information that could be made available to these students and that it could be obtained if our Division had the facilities for gathering it. Nevertheless, we have been pleased to be of this service meager as it may be.

During the past year opportunities for placement in the psychological field have not been numerous. The agencies that have invited us to assist them in finding personnel have not varied greatly from the list published in our 1943 report. However, it is anticipated that following the war a number of new agencies will be established in various parts of the country, thereby creating new positions in the field of psychology as well as in the fields of psychiatry and psychiatric social work. This assumption is based on the fact that the Division of Community Clinics of the National Committee has been asked on many occasions throughout the past two or more years concerning the advisability of establishing new clinics in mental hygiene and child guidance. For the present these new developments have been discouraged, due to the shortage of personnel, particularly of psychiatrists and psychiatric social workers. It is expected, also, that new positions may be created in the work of rehabilitation in the veterans hospitals throughout the United States, and it is hoped that psychologists will be called upon to make their contribution to this important work.

The foregoing account was prepared for your representative by Emily L. Martin, Secretary of the Division of Personnel.

Respectfully submitted,
JOSEPH ZUBIN

REPORT OF THE CHAIRMAN OF THE DIVISION OF ANTHROPOLOGY AND PSYCHOLOGY OF THE NATIONAL RESEARCH COUNCIL

To the Council of Directors and Members of the American Psychological Association:

When the fortunate day comes that the present war is over and we can look back at its events as social historians, we will see that the process of mobilizing personnel for the armed forces and for industry followed a definite curve. It is much more difficult to see this changing mobilization picture as we live through its war processes. It is clear even now that the changing demands of separate phases of war mobilization have a direct effect upon the part that the research scientist is called upon to play in the war effort.

This is especially true of the demands that are made for the services of anthropologists and psychologists. These two sciences are both concerned with the application of scientific techniques to man. As the needs for men and the use of men change in wartime, so also must the applied services of anthropology and psychology change. This does not mean, of course, that the Division is not carrying on certain very important basic studies begun before the war which will continue after the war. In the initial stages of the war effort the great emphasis of various Committees of the Division was on the development of better techniques for the proper selection of men for special tasks. The great problem was to assist in the proper transfer of civilians into the armed forces or into new industrial jobs. As mobilization becomes more complete, problems of selection continue, but they are also more and more supplemented by the need for assistance in providing new scientific procedures in the field of training. As the demobilization of war casualties and others being discharged from the Services becomes a movement of larger proportions, the attention of the Division is being increasingly directed toward problems of demobilization, rehabiltation, and even in certain respects to educational and vocational guidance. This is not intended to indicate that the scientific work on selection that is related to the Division is complete or that the work of the Committees of the Division that are concerned with training is over, but that a set of war problems are beginning to be associated with the other problems of the Division as it faces its emergency tasks. In this connection it may also be pointed out that those Committees of the Division which have been to some extent concerned with the proper engineering development of instruments of warfare so that such instruments will be fitted in an optimal way to human sense organs and reacting mechanisms are also finding that the demands for new weapons is changing as the Nation's war machine becomes in certain respects standardized.

Of course, much of the most important and interesting work carried out by the Division is still confidential or restricted and cannot be reviewed in this report. The active Committees of the Division are not unaware of the changing emphasis of the present phase of the war. They are continually modifying their techniques and their points of emphasis to meet these new conditions. In this connection it may be noted that selection, classification, training of new personnel, the modification of new weapons and of countermeasures against the enemies' new weapons, as well as the demobilization and rehabilitation of war casualties, are all now under way at the same time. These are not processes that occur, as we might wish as scientists, in simple serial order, but rather overlap and interlock as they impinge upon the work of the Division at the present time. In the future, as in the past, we must expect shifts in this total pattern so far as emphasis is concerned. It may be expected, however, that for a number of years all these problems will still be with us. As our enemies are defeated, it will still not be possible to stop in a sudden way the selection, induction, classification, and training of new individuals for the armed forces. This will, of course, be especially true if we are to have universal military training after the war. Thus, scientific procedures for selection, classification, and assignment of personnel will continue to be of importance to the Nation at the same time that demobilization and rehabilitation procedures will take on new characteristics as large numbers of men are returned to civilian life.

In all the work of the Division in regard to scientific techniques that assist in the better management of men we must remember that what we do in the NRC must in some cases be of a temporary sort—that is, temporary so far as the NRC is concerned. A problem in selection, classification, or job analysis is brought to the Division. We assist through our Committee structure in opening up a new field or developing new procedures. As soon as this has been accomplished, however, in some cases we transfer these new procedures to the operating agencies for continued and regular use.

In two notable cases this year we have handed back to the agency with which we have been working projects which developed in the Division. This was true in a very special way in the case of most of the work that had developed with the Services under a cooperative arrangement between the

Council and the National Defense Research Committee. In the case of one special project for the Navy we undertook a job analysis of the billets of the great Service. Procedures for this work were developed and an elaborate pilot study completed. The work has been judged to be important and it has now been taken over for continuation by the Navy Department itself.

The following brief summaries will, I believe, express the character of the work of certain of the psychological committees of the Division during the past year:

Upon the creation of the Applied Psychology Panel by the National Defense Research Committee, the Committee on Service Personnel—Selection and Training was disbanded as a NRC Committee, and on December 15, 1943, a new Committee on Applied Psychology and the War was formed under the chairmanship of John M. Stalnaker, for the purpose of conducting preliminary research on problems referred to it by the Panel. This work, which is of a confidential nature, involves research in which the armed services are interested.

Although the Committee on Child Development has held no meetings during the past year, three reports have been prepared as an outgrowth of the Conference of March, 1943. The National Research Council continues to provide office space not only for the Committee but also for the Society for Research in Child Development. Here, despite a serious lack of funds, the publication program of the Society is carried forward in its usual efficient way. Dr. R. S. Woodworth anticipates that the Committee will "arrange a conference or meeting during the coming year for the purpose of taking account of the present situation and drafting plans for the postwar period." Dr. Arthur T. Jersild has recently been appointed Secretary of this Committee.

The Committee on Classification of Military Personnel Advisory to the Adjutant General's Office, under the chairmanship of Dr. W. V. Bingham, in May of this year completed its fourth year of service. The Advisory Board on Mechanical and Technical Personnel, the formation of which was reported last year, has held several meetings and made recommendations with regard to problems of selecting men for training in mechanical occupations. The members of the parent Committee have continued to advise on many matters of concern to the Office of the Adjutant General. These have included, among others, such topics as rehabilitation, vocational counseling, radio code learning, officer candidate selection, and reclassification of enlisted personnel and officers prior to separation from the Services.

The Emergency Committee in Psychology, under the chairmanship of Major Karl M. Dallenbach, has conducted active liaison with coördinate Committees, government agencies concerned with various aspects of psychological work, and the Services. During the year the following Subcommittees have been discharged upon completion of their work or duplication or absorption of their assignments by other organizations: Subcommittee on Perceptual Problems, Subcommittee on Learning and Training, Subcommittee on the Listing of Personnel in Psychology, and Subcommittee on Services of Women Psychologists in the Emergency. The formation of a Subcommittee on the Library Classification of Psychological Tests was discussed at some length, but it was discovered after preliminary conference that the problem with which this Subcommittee would be charged was not of prime urgency in the war effort. Special Committees to study specific topics have dealt with the listing of translators, the listing of psychologists' activities, the surveying of opportunities for training in psychology, the unification of psychological services in the military establishment, the possibility of forming a Subcommittee on Industrial Psychology, and planning for the safeguarding of psychological tests and other personnel devices developed by the Services. Standing Subcommittees have been active in the following areas: stimulation of interest in problems of mental deficiency from both military and civilian standpoints and the gathering of data on the military success of mental defectives and on their success in war industries; outlining of ways in which psychology might be utilized in periods of rehabilitation and demobilization; preparation of *Psychology for the fighting man*, now in its third printing (400,000 copies), of a *Textbook in military psychology* at the collegiate level, and of *Psychology for the returning serviceman*, to be used as a sequel to *Psychology for the fighting man;* and study of problems in the selection and training of combat leaders. The Subcommittee on Survey and Planning has continued to deliberate and submit proposals to the parent Committee on many varied phases of opportunities confronting psychologists. As a result of a recent recommendation from this Subcommittee a Subcommittee on Occupational Standards of Psychologists has been appointed "to survey the present occupational standards for psychologists that have been established by Civil Service, State Merit Commissions, School Boards, etc. with a view of improving the professional specifications within psychology and the levels of qualifications within each."

The Committee on History of Psychology and the War, established in January of 1944 under the chairmanship of Dr. R. M. Yerkes, as its title suggests, is planning for the preparation of an historical record of the activities of psychologists in World War II. A Board of Consultants, representing the various agencies and organizations in which psychological work has been carried on, will assist the Committee in the procurement and preparation of materials for the history.

The Office of Psychological Personnel, now in its third year, has under the able directorship of Dr. Donald G. Marquis during the past year not only effectively carried out the duties with which it was originally charged but, as the war situation has changed, has assumed new and varied functions, in order to make for the maximum effective utilization of psychologists throughout the country, both within and without the armed services. A recent development, for example, has been the appointment of Dr. Robert R. Sears as Consultant to survey the possibilities of present and future utilization of clinical psychologists in the armed services.

The Committee on Latin-American Psychology has held no meetings during the year but its work continues in the line of publication of articles on Latin-American psychology, arranging for exchanges of journals, and the reviewing of Latin-American books on psychology. The development of research of North American psychologists in Latin-America (Intensive Regional Research) has been proposed, resulting in the suggestion by Dr. J. G. Beebe-Center, Chairman, that the present Committee be reorganized in order to make for more active participation in this area.

Early in 1944 the journal *Psychosomatic Medicine*, together with its Monograph Supplements, was transferred to the newly incorporated American Society for Research in Psychosomatic Problems to serve as its official organ. Upon completion of this transfer, the Committee on Problems of Neurotic Behavior, under the chairmanship of Dr. Walter R. Miles, which had sponsored the journal since 1939, requested that it be disbanded.

The Committee on Selection and Training of Aircraft Pilots, under the chairmanship of Dr. Morris S. Viteles, has continued to be financed by the Civil Aeronautics Administration, and research on the selection, training, and maintenance of flying personnel is being carried on as in the past at various universities throughout the country. A central Statistical Unit at the University of Rochester which is under the part-time directorship of Dr. Henry S. Odbert, Technical Aide to the Committee, is effectively handling the data emanating from the various experimental centers. An expanded editorial staff in the office of the Chairman is constantly preparing for publication reports from Project Directors in the field. These reports, covering all phases of the Committee's research, are sent to a selected distribution list of interested individuals. One of the most notable developments which has occurred under this important Committee is the establishment of an Institute of Aviation Psychology at the University of Tennessee, under the directorship of Dr. Robert Y. Walker. In the words of the Chairman "Through such an Institute, and others like it at other universities, steps can be taken to avoid the unfortunate cessation of basic and practical research which occurred at the close of the last war."

Of the six applications for fellowships received in the Division for the year 1944–1945, two were in the field of anthropology and four in the field of psychology. Review of these applications by the members of the Fellowship Committee resulted in the recommendation of the two anthropological candidates and Dr. Herman A. Witkin and Dr. John W. Thiesen among the psychological candidates. The annual meeting of the National Research Fellowship Board in the Natural Sciences eventuated in the appointment of the two psychological candidates. Dr. Thiesen's fellowship was subsequently declined, Dr. Witkin continuing in his reappointment status.

Respectfully submitted,
LEONARD CARMICHAEL, *Chairman*

REPORT OF THE REPRESENTATIVE TO THE SOCIAL SCIENCE RESEARCH COUNCIL

To the Council of Directors and Members of the American Psychological Association:

The long-range aim of the Social Science Research Council is to raise the level of thought and action in the social sciences. Through its committees and its staff it seeks, first, to improve the quality of personnel, methods of research, and facilities for work in the social sciences; second, to increase the body of established fact in the social sciences; third, to render services to individuals and institutions. A bare listing of the chief committees of the Council such as follows may serve to inform psychologists of the range of its work.

The Board of Directors of the Council is scheduled to meet only twice a year and for this reason it cannot maintain continuous close contact with the actual work of the Council. The Committee on Problems and Policy, therefore, is desiguated to play the active steering and operational roles, the latter in conjunction with a staff organization headed since 1931 by Robert T. Crane. A. T. Poffenberger is serving his second year as Chairman of "P & P," as this committee is familiarly known, and he is also a member of the Executive Committee. Other committees of the council include those on

Appraisal of research
Control of social data
Economic history
Ethnogeographic Board
Government
Grants-in-Aid
Guide for study of local history
Historiography
Industry and Trade
Labor Market research
Latin American studies
Micrographing materials for research
Public administration
Social adjustment
Social Science personnel
War studies

The Council is giving attention to topics which are not allocated to any of these committees. These include opinion and attitude polls, regional specialization and area studies in the universities, and war history. Of special interest to psychologists is the work of the Committee on social adjustment, under the chairmanship of E. W. Burgess. Its first program was practically completed upon publication of the monographs by Woodworth, Horst and Sears. The committee has now launched a new program. A sub-committee on social adjustment in old age is exploring that field. In another area Roger Barker is at work on a critical review of the research literature on rehabilitation of the physically handicapped. A third project is based on a number of previous studies in the field of social psychiatry and will test the hypothesis that manic-depressive psychotics and paranoid schizophrenics differ in the prepsychotic period in respect to socio-economic status and residential mobility.

The Social Science Research Council has joined in a formal arrangement with the National Research Council and the American Council of Learned Societies to facilitate joint interest and activities, to be known as the Conference Board of Associated Research Councils.

Support has been secured to continue the Council Office in Washington, which has been in effect a clearing house and coordinating center to aid governmental agencies, other institutions, and individuals.

The award of fellowships and grants-in-aid has been sharply affected by the war emergency. In 1939–1940 three fellowships and six grants-in-aid were awarded to psychologists. In the current year none.

The newly elected representative is Harold E. Jones, succeeding A. T. Poffenberger who continues as a member-at-large.

Respectfully submitted,
RICHARD M. ELLIOTT

REPORT OF THE REPRESENTATIVE TO THE NATIONAL COUNCIL ON REHABILITATION

To the Council of Directors and Members of the American Psychological Association:

This organization seems to be doing a splendid job of bringing together the various groups interested in rehabilitation. The members of the Executive Committee are for the most part leaders in their own professional groups. It is felt that, if psychologists have an interest in the process of rehabilitation, it would be desirable for the APA to continue its affiliation with the National Council on Rehabilitation.

A personal observation is presented for whatever it is worth. The Council at the present time is dominated by the medical profession, with social workers nurses, and therapists being more numerous but having less weight in the determination of the policies of the organization. The representatives present at the meeting appeared, in general, to have little understanding of how a psychologist might be a useful member of a professional team of persons dealing with the problems of rehabilitation. In support of this statement attention is called to the report of the "Committee to Define the Processes of Rehabilitation" (a copy of which was sent to all affiliated organizations). In the report it is suggested that the psychologist should have a place in the rehabilitation program, but his role in their program is very vague. The functions of the psychologist can perhaps be inferred, but a clearer statement seems desirable. For example, little is said about the psychologist working with the psychiatrist when a patient is in need of mental rehabilitation. In discussing the vocational aspect of rehabilitation the vocational counselor is mentioned and his functions are outlined, but no reference is made to the psychologist in this connection. Since the affiliated organizations will, within the next few months, be asked to express an opinion about the report of this committee it seems appropriate to suggest that the APA refer this report to some member for study and suggestions. It also seems logical that the AAAP would be interested in working with the APA on this problem. Consequently, it is recommended that Dr. Harold E. Burtt be called upon to consider the National Council's report insofar as he is chairman of a committee (set up by the AAAP) to study the role of the psychologist in the rehabilitation program.

The revised report of the Council will probably be given wide circulation among rehabilitation workers. Consequently, it is believed that a clarification of the functions of the psychologist would be mutually advantageous.

Respectfully submitted,
Louis Long

REPORT OF THE TREASURER AND BUSINESS MANAGER OF PUBLICATIONS*

To the Council of Directors and Members of the American Psychological Association:

I am transmitting herewith the annual financial report on the operations of the *Association.* This report has been audited by professional accountants and shows the financial condition of the *Association* as of December 31, 1943. Since the auditor's report is a detailed one, it would appear desirable to offer the following summary and interpretative comment.

Overall condition. On December 31, 1943, the net worth of the *Assocation* was $52,178.49, compared with $50,161.99 on the corresponding date the year before. This is an increase of $2,026.50 between the two dates, although the year included extraordinarily heavy expenses both in the publication ventures and the Treasurer's office.

Treasurer's Office. As in previous years, the amounts received from members are broken down into various categories; in 1943, $3.00 was allocated to the *Psychological Abstracts* and $.75 to the *Bulletin,* so that $6.25 from each Member and $2.25 from each Associate remains in the Treasurer's funds. These latter amounts are entered into the books as received and no effort is made to allocate them to the proper year. In 1943, $9,754.00 was so recorded. Since the dues notices are mailed in November for the next year's dues, most of this amount is actually collected in anticipation of expenditures in the new year, although in January of each year some 400 or 500 people are in arrears.

Exhibit A shows that the expense in the Treasurer's office, which includes all of the non-publication expenses of the *Association,* has never exceeded $6,500.00 for the ordinary services, although the membership has increased from 2318 to 3476.

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* This report involves more detail than previous ones because presumably a new Business Manager will take over these ventures once a reorganization of psychological societies has been effected.

EXHIBIT A

Summary of Income and Expense, 1938–43

INCOME

Dues	*1943*	*1942*	*1941*	*1940*	*1939*	*1938*
Members	$4,453.18	$4,593.82	$3,660.08	$3,768.30	$3,124.75	$3,488.25
Associate	5,301.82	5,624.61	2,892.85	3,053.56	2,571.17	2,758.75
Subscriptions						
Members & Assn.	9,972.80*	15,261.44	12,854.66	12,418.01	10,175.73	11,242.50
Spec. Comb.	6,920.00	5,152.50	5,389.00	3,579.03	—	—
Others	21,173.76†	17,593.05	17,768.75	16,910.58	19,897.84	17,375.29
Reprints	2,955.97	2,958.91	3,315.18	4,730.93	3,723.83	3,864.09
Back Numbers	3,733.07	1,975.40	2,805.57	2,410.23	2,832.69	1,849.33
Collections from Authors	1,176.52	1,049.49	3,135.06	1,906.70	2,781.36	771.51
Int. on Sav. Accounts	449.37	702.78	773.19	754.99	737.88	627.66
Int. on Bonds	958.00	385.07	178.65	—	—	512.06
Advertising	568.83	337.21	481.68	214.79	463.00	575.80
Miscellaneous	305.98	294.25	646.49	557.26	537.37	300.93
Profit on Sale of U.S. Govt. Bond						920.25
TOTALS	$57,969.30	$55,928.53	$53,902.06	$50,304.38	$46,845.62	$44,286.42

* Decrease due to decreased amounts allowed *Bulletin* and *Abstracts*.
† Increase due to purchase of *Journal of Applied Psychology*.

EXPENSE

	1943	*1942*	*1941*	*1940*	*1939*	*1938*
Printing Costs	$31,274.93	$26,533.91	$26,303.88	$24,470.63	$24,010.50	$23,145.36
Allowance to Officers and Editors	6,957.84	6,360.22	5,564.13	5,655.42	5,854.90	6,175.00
Compensation to Employees	5,539.64	5,079.78	5,074.77	4,606.25	4,532.40	3,608.53
Reprints	3,364.45	2,340.38	2,775.24	2,692.64	2,620.05	3,313.37
Abstractors Translators	445.40	479.64	716.75	1,001.12	1,260.01	1,570.34
Year Book	931.87	1,176.68	1,060.20	955.40	903.79	915.62
Office Supplies	2,017.72	1,382.07	1,327.99	888.37	1,111.59	1,352.70
Payments to Authors	99.00	146.12	650.82	838.21	1,473.87	522.28
Prof. Services	504.50	337.50	412.50	435.00	375.00	375.00
Provision for Doubtful Accounts	943.31	137.06	27.11	41.17	634.46	72.77
Annual Meeting Exp.	36.57	450.53	466.62	104.14	154.15	516.00
Com. Expense	245.86	623.30	312.59	276.32	34.01	265.95
Net Cost, O.P.P.	3,172.79	4,971.36				
Miscellaneous	1,356.18	1,200.34	731.00	1,535.45	999.29	255.55
Committee Displaced For. Psychologists			235.05	325.01	16.64	
Addressing Equip. Purchased					1,209.19	237.01
TOTAL EXPENSE	$56,890.06	$51,218.89	$45,658.65	$43,825.13	$45,189.85	$42,253.31
Treasurer's Office	8,147.88	11,475.44	6,126.42	5,409.81	4,526.53	5,771.22
Membership	3,476	3,231	2,937	2,739	2,527	—
Publications, Total Number of Units	152,300	128,000	112,650	101,000	—	—
Monographs, Total	5,549	5,265	3,749	3,120	—	—
GRAND TOTAL	157,849	133,265	116,399	105,020	—	—

Publications, Total Number of Units (estimate for 1944), 157,500.

Aside from dues, the other principal source of income is interest on investments, which in 1943 amounted to $1,373.38, and some of which is reserved for special purposes to be described later in this report.

In 1943 a special levy of $2.00 for each Member and Associate was voted to aid in the operation of the *Office of Psychological Personnel*. The amount collected during the year in this fund was $5,793.99. Not every person paid. There were various reasons: our Canadian members felt that they should not be required to pay, for obvious reasons; the name "war service assessment" was not congenial to some of the members who are conscientious objectors; some people were not cordial to the extension of the secretary's function implied in the action taken. It was in the interests of this contrary individual and group opinion that Council provided for a special assessment rather than an increase in the dues. If a person refuses to pay all or part of his dues, the Teasurer has no recourse but to certify him as delinquent, a status which, according to the By-Laws, eventually results in his separation from membership, whereas a person can refuse to pay an assessment levied for a special purpose without endangering his membership status.

Disregarding the war service assessment, the Treasurer's office ended the year with a surplus of $3,065.20 for the period.

Office of Psychological Personnel. The *Association* voted to underwrite the activities of this office to the extent of $10,000 for the year with the understanding that any unexpended funds would be refunded. For several reasons it appeared that the best way to handle the matter would be to make payments of the full amount to the *National Research Council.* This was done in four installments. A report on the expenditures is included in the *Report of the Director of the Office of Psychological Personnel.* The operation of the Treasurer's Office in connection with the fund is thus easily summarized:

Contribution to N.R.C.	$10,000.00		$10,000.00
Collection of Assessment		$5,793.99	
Refund from N.R.C.		1,033.22	6,827.21
Net cost to A.P.A.			$3,172.79

This compares with a total cost of $4,971.36 in the previous year without the assessment.

Psychological Bulletin. The *Bulletin* has had an uncertain financial status of recent years. Under the Psychological Review Company it constantly lost money, but since it has been tied in more completely with the Association, as the official publication, it has occasionally shown a profit. The *Program Number* in July and by an arrangement of long standing, any excess over 60 pages in the November issue, which carries the *Proceedings* of the *Annual Meeting* have been paid for by the Treasurer's office; but for 1943, although there was no program, a July issue was prepared and charged wholly to the *Bulletin* account, while the *Proceedings* were so abbreviated that there was no income to the *Bulletin* from this source. In addition, the amount made available to the *Bulletin* from the dues was cut from 75 cents to 50 cents so that the *Bulletin* this year shows a deficit of $1,808.40. This is a bookkeeping deficit because in the main what the *Bulletin* loses, the Treasurer's office saves. The detail of this journal's operations for six years is shown in Exhibit B, while the audited accounts show it for 1943 in even great detail.

EXHIBIT B

Psychological Bulletin,

	1943	*1942*	*1941*	*1940*	*1939*	*1938*
INCOME*						
Members and Associates	$1,404.80	$2,397.50	$2,030.90	$1,954.50	$1,588.50	$1,339.50
Library Subscr........	3,006.54	2,758.65	2,986.45	2,271.76	2,765.34	1,608.53
From Treas...........	—	580.42	1,383.69	536.75	231.00	261.00
Other Income.........	1,316.81	815.99	1,577.05	1,445.52	974.56	1,093.23
Total Income.......	$5,728.15	$6,552.56	$7,978.09	$6,208.53	$5,559.40	$4,302.26
EXPENSES*						
Printing..............	$4,877.98	$6,136.23	$5,201.75	$4,794.24	$4,135.12	$2,744.72
Other Expense........	2,658.57	1,078.34	2,296.60	1,513.57	1,550.07	1,199.03
Total Expense......	$7,536.55	$7,214.57	$7,498.35	$6,307.81	$5,685.19	$3,943.75
Total Circulation......	3,474	3,445	3,201	2,977	2,592	624

* Includes in income, the amount contributed by the Treasurer's office, and in expense the printing bills include amounts charged to the Treasurer's office by the auditor.

Psychological Abstracts. In 1937 the dues provided for $4.00 for the *Abstracts*, an amount which remained unchanged until 1943 when it was reduced to $3.00. This retrenchment was in large part made possible by a reduction of expense in the editorial office due to a wartime scarcity in editorial material. To offset these savings the circulation has been increasing during this time and printing rates have increased, so the expense does not show an inconstant relation to income. This year there was a deficit of $205.97. This is not a serious matter in view of the long history of surpluses for this financial division. Exhibit C gives a detailed picture of the *Abstracts*' operations.

EXHIBIT C

Psychological Abstracts

	1943	1942	1941	1940	1939	1938
INCOME						
Members & Assoc.	$ 8,568.00	$12,863.94	$10,823.76	$10,463.41	$ 8,487.23	$ 9,903.00
Library Subscr.	3,672.18	3,575.73	3,937.46	3,542.85	4,070.47	3,152.95
Other Income	1,512.18	686.49	1,420.26	1,196.24	1,053.65	1,062.47
Total Income	$13,752.36	$17,126.16	$16,181.48	$15,202.60	$13,711.35	$14,118.42
EXPENSE						
Printing	$ 6,178.54	$ 6,243.85	$ 6,438.38	$ 6,556.48	$ 6,628.80	$ 7,069.25
Editorial Office	5,454.11	5,598.72	5,690.29	6,044.54	6,326.31	6,703.08
Business Office	2,325.68	1,742.42	1,704.63	1,043.64	1,134.46	1,000.10
Total Expense	$13,958.33	$13,584.99	$13,833.30	$13,644.66	$14,089.57	$14,772.43
Total Circulation	3,649	3,591	3,338	3,146	2,776	2,701

Journal of Abnormal and Social Psychology. The April issue of the *Journal* was a double number including a special issue called a *Clinical Supplement.* It comprised 204 pages and cost $928.61 to produce, exclusive of free reprints furnished to authors. Otherwise, there were no special financial considerations to make this year different from others. The *Journal* continues to be in good financial condition. The reserve for its operation stands at $4,672.60 after subtracting the deficits for the year. See Exhibit D.

EXHIBIT D

Journal of Abnormal and Social Psychology

	1943	1942	1941	1940	1939	1938
INCOME						
Library Subscr.	$2,875.16	$2,851.69	$2,909.30	$2,742.74	$3,050.71	$2,729.34
Club Subscr.	923.00	687.00	711.56	578.90	—	—
Other Income	773.20	1,070.05	784.68	930.61	855.86	837.94
Total Income	$4,571.36	$4,608.74	$4,405.54	$4,252.25	$3,906.57	$3,567.28
EXPENSE						
Printing	$4,099.23†	$2,870.32	$2,524.89	$2,397.33	$2,190.93	$2,340.41
Other Expense	1,474.36	975.34	855.82	1,148.00	1,073.77	1,077.91
Total Expense	$5,573.59	$3,845.66	$3,380.71	$3,545.33	$3,264.70	$3,418.22
Net Income	$1,002.23*	$ 763.08	$1,024.83	$ 706.92	$ 641.87	$ 148.96
Reserve	$4,672.60	$5,674.83	$4,911.75	$3,886.92	$3,180.00	$2,580.15
Total Circulation	1,569	1,302	1,158	922	540	607

† Includes special clinical number.
* Indicates deficit.

Psychological Review. For the first time in recent history the *Review* shows a deficit for the year. The analysis in Exhibit E shows that the income from library subscriptions fell off seriously during the year. This also is the year in which the *Jubilee Number* was produced, so the printing costs are higher than they were a year ago. The gradual increase in printing costs is due principally to the gradual increase in the size of the editions. We do not feel that the deficit is serious because of the long record of this journal as a money maker.

Journal of Experimental Psychology. The *Journal of Experimental Psychology* finished the year with a balance of $68.24. Exhibit F shows that the long history of deficits in this journal is over, a fact which can be attributed to the club subscriptions. The decrease in library subscriptions reflects the loss of foreign subscribers, but the fiscal aspect of this loss has been successfully absorbed by the club subscriptions. In 1944 only one volume of this journal will appear, but the financial picture will not change. Both income and expense will be about half their 1943 magnitudes.

EXHIBIT E

Psychological Review

	1943	*1942*	*1941*	*1940*	*1939*	*1938*
INCOME						
Library Subscr........	$2,513.96	$3,200.24	$3,166.76	$3,123.25	$3,752.73	$3,521.82
Club Subscr..........	922.25	858.75	794.88	653.85	—	—
Other Income.........	642.58	806.32	775.03	978.39	975.16	646.77
Total Income.....	$4,078.79	$4,865.31	$4,736.67	$4,755.49	$4,727.89	$4,168.59
EXPENSE						
Printing..............	$3,746.82†	$3,033.96	$2,604.71	$2,280.03	$2,551.85	$2,406.80
Other Expenses.......	1,218.58	1,040.14	1,128.16	1,184.41	1,358.73	1,028.67
Total Expenses....	$4,695.40	$4,074.10	$3,732.87	$3,464.44	$3,910.58	$3,435.47
Net Income.......	$ 616.61*	$ 791.21	$1,003.80	$1,291.05	$ 817.31	$ 733.12
Circulation.......	1,543	1,306	1,132	1,041	722	808

† Includes Jubilee Number.
* Deficit.

EXHIBIT F

Journal of Experimental Psychology

	1943	*1942*	*1941*	*1940*	*1939*	*1938*
INCOME						
Library Subscr.........	$4,215.87	$4,209.15	$3,635.37	$4,224.46	$5,265.96	$4,887.78
Club Subscr...........	2,771.00	2,576.25	2,999.36	1,638.76	—	—
Other Income.........	1,725.33	1,656.69	2,070.32	2,681.76	2,266.76	1,823.56
Total Income.....	$8,712.20	$8,442.09	$8,705.05	$8,544.98	$7,532.72	$6,711.34
EXPENSE						
Printing..............	$6,546.56	$6,295.41	$5,767.38	$6,050.12	$5,881.42	$5,801.05
Other Expenses.......	2,097.40	1,817.31	1,997.86	2,711.48	2,443.38	2,064.35
Total Expense....	$8,643.96	$8,112.72	$7,765.24	$8,761.60	$8,324.80	$7,865.40
Net Income......	$ 68.24	$ 329.37	$ 939.81	$ 216.62*	$ 792.08*	$1,154.06*
Circulation..........	1,298	1,087	977	755	411	447

* Indicates deficit.

Psychological Monographs. The financial detail for the operation of the *Monographs* varies widely over the years. It is handled for authors on what amounts to a commission basis so there is no possibility of a loss on operations. Printing costs cannot be estimated in advance because of the varying numbers of each Monograph which are printed. For this reason no exhibit of income and expense accompanies this account. The financial details are worked out with each author individually on the basis of printers' estimates. These are covered in detail in the auditor's report for 1943, which shows a surplus of $126.79 for the year. A year earlier there was a deficit of $6.82. To end a two-year period with a balance of approximately $120.00 during which time the total expenses were $7,000, shows that we are accomplishing the purpose underlying the Monograph publication—to produce these studies at no profit to the *Association.*

Many questions come to us regarding the cost to the author of a publication in the Monograph Series. Since each Monograph presents a peculiar problem in composition and production generally, the Business Manager has been reluctant to commit the *Association* to any standard price. Perhaps it would be safe to say that the present scale usually results in a charge to the author which may be regarded as a rate of $2.25 to $2.50 a page. This rate is meaningless, however, unless we remember that the word count of the two-column format greatly exceeds that of the single column. At present we average 695 words a page. On occasion authors have received refunds, because of unanticipated sales, so the actual cost to them was less than this amount. Authors who have obtained competitive bids from other publishers are pleased with the Association's comparative costs. The circulation of 1400 for 1944 is also greater than can be obtained with any other competing medium.

The Journal of Applied Psychology. The history of the *Journal of Applied Psychology* under the ownership of the Association is too short to present in a chronological exhibit. This is the end of our first year. The subscriptions to libraries and individuals are greater than any other journal; the income from this source stands at $3900, compared with $3700 for the *Abstracts*, formerly the leader. The total income was $6290.37, while the expense was $4838.17, resulting in a balance of $1452.20. During this year no payments were made on the purchase price of the *Journal*, an arrangement which permits us to accumulate a small surplus as a protection against greater expenses through the years in which the payments will have to be met. In 1944, after making a payment of $1000, we will have only a small balance remaining.

The operation of this *Journal* is tied in intimately with the financial condition of the *Association* as a whole. In 1942 we set up a liability of $10,000, the purchase price of the *Journal of Applied Psychology* which was subtracted from the estimate of net worth. The net worth of the *Association* will be increased $1000 a year from this source alone, as payments are made over a period of 10 years.

Club Subscriptions. It is quite clear that the income from club subscriptions is an important factor in permitting the publications to survive the loss of foreign subscriptions with no great shock to their financial struture. In other fields, some journals have suspended publication and others are limping through the war period.

The number of club subscriptions is determined by the cost and variety of materials made available, together with the size of the *Association* as a whole.

	1944	*1943*	*1942*	*1941*	*1940*	*1939*
Size of Assn.	(3750)*	3476	3231	2937	2739	2527
Number of Clubs	(1200)*	923	687	551	351	None
Price	$7.50	$7.50	$7.50	$8.00	$10.00	None

* Estimated

Loss of Foreign Subscriptions. In 1939 it became impossible to continue contacts with some of the belligerents. One by one other countries were added to this list until in late 1941 we were left with only a handful of subscribers outside the United States. In July of 1941, the American Library Association, through its Committee on Devastated Libraries, began to collect cancelled subscription lists for institutions in war areas. In October of that year the A.L.A. purchased 5 sets of the 1941 volume of the *Psychological Review*. In view of the limited finances of the committee we made a price of $3.00 a set on this journal, which retails at $5.50, and agreed to store them until the end of the war. The Library Association assumed the responsibility of getting them to subscribers.

Gradually more money became available and the Library Association increased its purchases until as of December, 1943, the following reserve was in effect. These journals are wrapped separately and are not included in our inventory of back numbers.

American Library Association Reserve

	1944	*1943*	*1942*	*1941*	*1940*
Abstracts	25	25	25	20	20
Bulletin	15	15	15	5	—
Review	50	50	50	35	20
Experimental	20	20	20	5	—
Abnormal and Soc.	20	20	20	5	—
Applied	20	20	—	—	—

Late in 1943 we received an order from the Chinese Minister of Education through the Universal Trading Corporation for 20 sets of all seven of our journals for the years 1940–1946, inclusive. These were furnished and the Corporation is on our mailing list at present for 20 sets of each issue. The storage and shipping responsibilities are assumed by the Corporation. In addition a few journals go to the Associated Boards of Christian Colleges in China, to be stored until after the war. Possibly 10 European universities are maintaining their subscriptions through their usual agents. All of these operations required a great deal of time in searching out subscription data.

Paper Shortage. The Association is cooperating in the observance of governmental restrictions in the use of paper. This task is made difficult because our subscription list is constantly increasing and can be accomplished only by the use of the most rigid economies aimed at getting a maximum number of characters on a page.

Respectfully submitted,
WILLARD L. VALENTINE, *Treasurer and Business Manager*

REPORT OF EXAMINATION
AMERICAN PSYCHOLOGICAL ASSOCIATION, INC.
YEAR ENDED DECEMBER 31, 1943

Auditor's Certificate

February 17, 1944

American Psychological Association, Inc.,
Evanston, Illinois.

We have examined the balance sheet of the American Psychological Association, Inc. as of December 31, 1943, and the statements of income and expense and net worth for the year then ended, have reviewed the accounting procedures of the Association and, without making a detailed audit of the transactions, have examined or tested accounting records of the Association and other supporting evidence, by methods and to the extent outlined in this report.

A summary of the balance sheets at December 31, 1943, and December 31, 1942, follows:

Assets	Dec. 31, 1943	Dec. 31, 1942	Increase Decrease*
Cash	$57,193.00	$58,746.61	$1,553.61*
Marketable securities	38,274.58	37,962.08	312.50
Accounts receivable—net	3,170.10	3,202.11	32.01*
Inventories:			
Valuation placed on stock of back numbers of publications	1.00	1.00	
	$98,638.68	$99,911.80	$1,273.12*
Liabilities and Net Worth			
Accounts payable	$ 2,790.20	$ 2,835.20	$ 45.00*
Contract payable	10,000.00	10,000.00	
Deferred income:			
Unexpired subscriptions	20,815.45	23,027.83	2,212.38*
Reserved for special purposes	12,854.54	13,896.78	1,042.24*
Net worth	52,178.49	50,151.99	2,026.50
	$98,638.68	$99,911.80	$1,273.12*

The following comments relate to the accompanying financial statements and to the scope of our examination:

Cash on deposit and in savings accounts was reconciled with the amounts shown in certificates received directly from the depositaries. Office cash funds were confirmed by direct correspondence with the custodians thereof. The records of cash transactions for the year were checked by comparisons of the totals of cash receipts recorded in the cash book with deposits shown in monthly bank statements and by inspection of paid checks, invoices, or other data on file in support of the recorded disbursements.

Marketable securities, which were presented for our inspection, are shown below:

	Interest Rate	Cost	Redemption or Market Value Dec. 31, 1943	Accrued Interest Dec. 31, 1943
U. S. Savings bonds—Series G, due November 1, 1953	$2\frac{1}{2}\%$	$ 5,000.00	$ 4,810.00	$ 20.83
U. S. Savings bonds—Series G, due December 1, 1954	$2\frac{1}{2}\%$	25,000.00	24,450.00	364.58
		$30,000.00	$29,260.00	$385.41
Chesapeake & Ohio Railway Co. refunding and improvement mortgages, Series G, due February 1, 1960	$2\frac{6}{10}\%$	7,802.50	7,940.00	86.67
Totals		$37,802.50	$37,200.00	$472.08

The amount stated for accounts receivable was in agreement with the total of a listing of the individual accounts. We did not correspond with the debtors for confirmation of the balances due. Since the Association follows the policy of recording income from dues of members and associates only when the payment therefore is received, no asset amount is shown in the balance sheet for unpaid dues.

All ascertained liabilities of the Association at December 31, 1943 have been provided for in the accompanying balance sheet.

A summary of the account of the Committee on Aid to Displaced Foreign Psychologists is presented as follows:

Unexpended balance at January 1, 1943		$130.46
Expenses of the committee for the year 1943	$ 3.38	
Amount recorded as income of the year—upon dissolution of committee	127.08	130.46
Balance at December 31, 1943		$

Expenses of committees of the Association for the year 1943 are summarized in the following:

Committee on Examination Questions	$ 55.00
Committee on Modification of Courses in Psychology produced by the war	19.90
Committee on Extensions of Secretariat	2.17
Committee on New Constitution	295.87
	$372.94
Less amount recorded as income upon dissolution of Committee on Aid to Displaced Foreign Psychologists	127.08
Total	$245.86

Deferred income represents the unexpired portion of subscriptions to the various publications of the Association at December 31, 1943. We tested the computations of the Association with respect to the amounts deferred to cover the unexpired subscriptions.

Information submitted to us indicated that certain funds reserved for special purposes were not to be considered a part of the general funds of the Association. The Council has authorized that cash be deposited in a special savings account in the People's Savings Bank in Providence, to be used for post-war reconstruction of psychology. The amount of $3,181.94 in this account represents the unexpended balance of funds received for the ninth international meeting plus accumulated interest thereon to December 31, 1943. Under the terms of a gift whereby the Association acquired the *Journal of Abnormal and Social Psychology*, any surplus funds arising from its publication are to be used solely for the purposes of that journal. The amount of such surplus funds at December 31, 1943, was determined as follows:

Balance at January 1, 1943	$5,674.83
Less excess of expense over income for the year—as shown by accompanying statement of income and expense	1,002.23
Balance at December 31, 1943	$4,672.60

Changes in the account "Assessment from members for maintenance of Office of Psychological Personnel" are next presented:

Balance at January 1, 1943	$ 4,964.50
Collections	5,829.49
	$10,793.99
Amount applied as reduction of expense	5,793.99
Balance at December 31, 1943	$ 5,000.00

The balance at December 31, 1943 is to be used to maintain the Office of Psychological Personnel during the year 1944.

Opinion

In our opinion, the accompanying balance sheet and statements of income and expense and net worth present fairly the position of the AMERICAN PSYCHOLOGICAL ASSOCIATION, INC. at December 31, 1943, and the results of its operations for the year, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

ERNST & ERNST
Certified Public Accountants

BALANCE SHEET

AMERICAN PSYCHOLOGICAL ASSOCIATION, INC.

December 31, 1943

ASSETS

Cash			
Demand deposit		$24,834.57	
Savings accounts ($7,854.54 reserved for special purposes)		32,293.43	
Office cash funds		65.00	$57,193.00
Marketable Securities			
U. S. savings bonds—at cost	$30,000.00		
Railroad bonds—at cost	7,802.50	$37,802.50	
Accrued interest on bonds		472.08	38,274.58
Accounts Receivable			
For sales, reprints, printing costs, etc.		$ 4,953.21	
Less reserve		1,783.11	3,170.10
Inventories			
Valuation placed on stock of back numbers of publications			1.00
			$98,638.68

LIABILITIES AND NET WORTH

Accounts Payable		
For printing costs and expenses	$2,090.20	
To authors of Psychological Monographs	194.10	
Pay roll deductions—employees income tax	505.90	$ 2,790.20
Contract Payable		
Due to Dr. James P. Porter for purchase of Journal of Applied Psychology—payable $83.33 per month beginning January 31, 1944		10,000.00
Deferred Income		
Unexpired subscriptions to:		
Psychological Abstracts	$8,219.53	
Journal of Experimental Psychology	1,849.16	
Psychological Bulletin	2,380.02	
Psychological Review	1,720.51	
Journal of Abnormal and Social Psychology	1,742.37	
Psychological Monographs	2,436.35	
Journal of Applied Psychology	2,467.51	20,815.45

Reserved for Special Purposes		
Funds to be used for post-war reconstruction of psychology	$3,181.94	
Surplus funds of Journal of Abnormal and Social Psychology	4,672.60	
	$7,854.54	
Assessment from members for maintenance of Office of Psychological Personnel for the year 1944	5,000.00	12,854.54
Net Worth		
Balance at December 31, 1943		52,178.49
		$98,638.68

STATEMENT OF NET WORTH

AMERICAN PSYCHOLOGICAL ASSOCIATION, INC.

Year ended December 31, 1943

Balance at January 1, 1943		$50,151.99
Add:		
Net income for the year as shown by accompanying statement of income and expense	$1,079.22	
Excess of expense over income of Journal of Abnormal and Social Psychology—charged to reserve for special purposes	1,002.23	
	$2,081.45	
Less portion of net income reserved for special purposes: Interest on funds to be used for post-war reconstruction of psychology	54.95	2,026.50
Balance at December 31, 1943		$52,178.49

STATEMENT OF INCOME AND EXPENSE
AMERICAN PSYCHOLOGICAL ASSOCIATION, INC.
Year ended December 31, 1943

	Total	Treasurer's Office	Journal of Abnormal and Social Psychology	Psychological Abstracts	Psychological Review	Psychological Bulletin	Journal of Experimental Psychology	Psychological Monographs	Journal of Applied Psychology
INCOME									
Dues:									
Members	$ 4,453.18	$ 4,453.18							
Associates	5,301.82	5,301.82							
Subscriptions:									
Members and associates	9,972.80			$ 8,568.00		$1,404.80			
Special combination	6,920.00		$ 923.00		$ 922.25		$2,771.00	$1,152.00	$1,151.75
Others	21,173.76		2,875.16	3,672.18	2,513.96	3,006.54	4,215.87	985.00	3,905.05
Reprints or prior publications	2,955.97		357.04		281.04	655.11	1,061.06		601.72
Sale of single copies and back numbers	3,733.07		370.16	1,025.99	346.12	438.08	640.04	298.46	614.22
Collections from authors for printing costs	1,176.52							1,176.52	
Interest on savings accounts	449.37	414.38	34.99						
Interest on investments	958.00	958.00							
Advertisements	568.83			404.69		164.14			
Miscellaneous, including allocation of general income	305.98	85.70	11.01	81.50	15.42	59.48	24.23	11.01	17.63
	$57,969.30	$11,213.08	$4,571.36	$13,752.36	$4,078.79	$5,728.15	$8,712.20	$3,622.99	$6,290.37
EXPENSE									
Compensation to employees	$ 5,539.66		$ 183.39	$ 3,228.92	$ 256.75	$ 990.32	$ 403.46	$ 183.39	$ 293.43
Allowances to officers and editors	6,957.84	$ 2,412.02	425.00	2,770.82	300.00	300.00	400.00	50.00	300.00
Printing costs	31,274.93	71.36	4,099.23	6,178.54	3,476.82	4,877.98	6,546.56	2,743.66	3,280.78
Reprints	3,364.45	116.57	650.73		454.44	825.74	980.99		335.98
Abstractors and translators	445.40			445.40					
Office supplies and expense	2,017.72	728.04	47.15	695.60	66.01	254.61	103.72	47.15	75.44
Miscellaneous, including allocation of general expense	1,356.18	89.90	101.93	350.59	76.41	301.36	101.28	200.09	134.62
Yearbook	931.87	931.87							
Payments to authors	99.00							99.00	
Provision for doubtful accounts	943.31		66.16	288.46	64.97	13.46*	107.95	172.91	256.32
Professional services	504.50	342.90							161.60
Annual meeting expense	36.57	36.57							
Committee expense	245.86	245.86							
Office of Psychological Personnel (after deduction of contributions of $5,793.99)	3,172.79	3,172.79							
	$56,890.08	$ 8,147.88	$5,573.59	$13,958.33	$4,695.40	$7,536.55	$8,643.96	$3,496.20	$4,838.17
NET INCOME	$ 1,079.22	$ 3,065.20	$1,002.23*	$ 205.97*	$ 616.61*	$1,808.40*	$ 68.24	$ 126.79	$1,452.20

* Indicates negative amount.

BUDGET FOR 1945

TREASURER'S OFFICE

Estimated Income

Dues (M, $6.00; A, $2.00)	$ 9,600.00
Subscriptions	
Abstracts	10,800.00
Bulletin	3,600.00
Interest	1,400.00
Sale of Yearbooks and Programs	
Assessment ($2.00 per Member and Associate, allowing for 50 who do not pay it.)	7,100.00
	$32,500.00

Estimated Expenses

Subscriptions	
Abstracts	$10,800.00
Bulletin	3,600.00
Office Supplies and Expense	500.00
Telephone and Telegraph	100.00
Printing	500.00
Proceedings	600.00
Yearbook	1,500.00
Treasurer's Bond	100.00
Secretary's Stipend	3,000.00
Treasurer's Stipend	400.00
Auditing Accounts	375.00
Incidentals, Annual Meeting	300.00
Intersociety Color Council	25.00
Membership in American Council on Education	10.00
Membership on National Council of Rehabilitation	25.00
Program Committee	50.00
Office of Psychological Personnel	10,000.00
Committee on the Constitution	600.00
Election Committee	200.00
Board of Editors, traveling expenses	300.00
Contingency Fund	1,500.00
	$34,485.00

PROCEEDINGS OF THE FALL MEETING OF THE ROCKY MOUNTAIN BRANCH OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION

Lillian G. Portenier, University of Wyoming

The Rocky Mountain Branch of the American Psychological Association met in conjunction with the Colorado-Wyoming Academy of Science at Denver University, Oct. 14, 1944. This was the first meeting of the organization since Nov. 8, 1941. Meetings were dispensed with during the interim due to wartime stringency and restrictions on travel.

PROGRAM

Saturday morning, October 14, 1944

Martha Lou Lemmon, Colorado College, Acting Chairman

Mechanical Aptitudes of University Women. Lillian G. Portenier, University of Wyoming.

The Amount and Locus of Transfer in Relearning a Perceptual-Motor Task. Miriam E. Crowley, Cheyenne, Wyoming.

The Empirical Distinction between Selfish and Unselfish Behavior. Paul Crissman, University of Wyoming.

Limitations of Electroencephalography. L. I. O'Kelley, U. S. Army.

W. A. Blakley, Colorado College, and Lillian G. Portenier, University of Wyoming, who attended the meeting of the American Psychological Association held at Cleveland, Ohio, in September, reported on activities and problems considered at the meeting. Special attention was given to the proposed fusion of the AAAP with the APA, the problem of rehabilitation of returning war veterans, and the reciprocal adjustments of citizens and soldiers.

Following the program, a business meeting with election of officers was held: *President and Chairman*, 1944–1945, L. W. Miller, University of Denver; *Executive Secretary-Treasurer*, 1944–1947, Lillian G. Portenier, University of Wyoming.

PSYCHOLOGY AND THE WAR

Edited by

DONALD G. MARQUIS

CONTENTS

VETERANS ADMINISTRATION VOCATIONAL TRAINING PROGRAM: PROCESSING PROCEDURES USED BY THE COLLEGE OF THE CITY OF NEW YORK, by *Daniel F. Brophy and Louis Long*.... 795

VETERANS ADMINISTRATION VOCATIONAL TRAINING PROGRAM: PROCESSING PROCEDURES USED BY THE COLLEGE OF THE CITY OF NEW YORK

DANIEL F. BROPHY AND LOUIS LONG
College of the City of New York

Veterans Administration. In the year 1921 all those governmental agencies which were concerned with the handling of the affairs of disabled veterans of all our wars were combined under one organization which was called the Veterans Bureau. In 1931 the functions of this Bureau were extended to cover the affairs of all veterans, whether or not disabled, of all our wars. Brigadier General Frank T. Hines was appointed Administrator of Veterans' Affairs and this new agency under him was called the Veterans Administration. As part of its activities it operates veterans' hospitals, adjusts and pays pension claims of veterans, represents the veteran in all matters which concern him which arise in the course of government business and administers the Veterans Rehabilitation Program. This last activity deals with the re-training and re-employment program outlined in the Baruch Report for which provision is made under Public Laws 16 and 346.

Public Laws 16 and 346. Public Law 16 provides for the extension of educational and training opportunities to all disabled veterans whose disability prevents the resumption of a previous occupation, or whose abilities are not effectively utilized in a field of employment in which the veteran is now, or was previously engaged. To help decide upon a new educational or job objective and to establish the feasibility of the proposed objective, the Veterans Administration has set up a screening process of which all disabled veterans making claims under Public Law 16 must avail themselves. In the event that the proposed objective is approved, the veteran is entitled to training or education for a period of not more than four years. The government agrees to pay tuition and fees for this training up to $500 a year. It also provides a living allowance over and above the disability allowance which is determined according to the family status of the veteran.

The so-called G.I. Bill or Public Law 346 permits any veteran whose education has been interrupted to resume his education at government expense. Under this law the veteran is entitled to one year of training plus an equivalent of the number of months which the veteran has spent in service. Allowance is not made, however, for those months which the veteran may have spent either in the Army Specialized Training Program or in the Navy College Training Program since these programs were regarded as an extension of a serviceman's college education. Any veteran who entered the service below the age of 25 is presumed to have had his education interrupted. All veterans of whatever age who have served at least 90 days (not ASTP, NCTP, or academies), between September 16, 1940 and the termination of the war or who have been discharged in less than 90 days because of service-incurred disability and who have been discharged for reasons other than dishonorable, are entitled to one calendar year of refresher or retraining course. To help these veterans reach a decision with regard to an educational or occupational goal, the screening facilities mentioned in the previous paragraph are available but the veteran is not obliged to make use of them under this Law as he is under Public Law 16. The maximum number of months for training under this program is 48 and the maximum tuition and fees which may be paid for any one year is $500. A subsistence allowance is made in this case also.

Responsibilities of Screening Center and Regional Office. The screening and advisement process set up by the Veterans Administration was in the beginning operated by personnel of Veterans Administration itself. It soon became apparent, however, that for various reasons it would be necessary to get additional help. In the first place the number of discharged veterans was increasing at so rapid a rate that too heavy a burden was thrown upon the Veterans Administration staff and there were so few competent, trained advisors available that the securing of additional staff was extremely difficult. The officials of the Veterans Administration recognized the fact that there was a psychological advantage to be gained by using trained staffs in educational institutions which had existing educational and vocational advisement programs. They felt that both the general public and the veteran himself would much more readily accept screening by these organizations. Accordingly, negotiations were begun with various institutions to set up advisement centers of this type and the first of these was opened at the College of the City of New York on June 26, 1944. It was expected that this Center would be operated as a "pilot" unit where difficulties in the existing program could be discovered and worked out. Our experience at the College has indicated that the understanding and cooperative attitude on the part of Veterans Administration officials in modifying procedures and correcting errors justifies an optimistic attitude toward the ultimate success of the program.

In undertaking this program, the personnel Bureau at the College of the City of New York agreed to deal with the following phases of the work:

1. The accomplishing of the necessary Veterans Administration forms.
2. The determining of the disabled veteran's need for training under Public Law 16.
3. The counseling of the veteran on job objectives.
4. The administering and interpreting of psychological and aptitude tests and questionnaires.
5. The recommending of a specific job or educational objective for the veteran.

The phases of the program for which the Regional Office of Veterans Administration is responsible are the following:

1. Receiving and approving the veteran's application for training.
2. Scheduling of the veteran for his appearance at a screening center.
3. Collecting and making available to the screening center all records, forms, medical reports and summaries concerning the veteran.
4. Approving the job objective selected by the screening center.
5. Selecting an institution or training organization at which the training is to be given. (This applies particularly to the disabled veteran.)
6. Following up the veteran's progress in training.
7. Aiding the veteran in finding placement after the completion of his training.

Eligibility. The discharged veteran who has any service-incurred disability which he believes will prevent him from returning to his previous occupation or which may be aggravated by the resumption of his previous occupation, or which prevents him from undertaking work at a level at which his other abilities would normally cause him to seek employment, may apply to the Regional Office of Veterans Administration for training under Public Law 16. In making application he fills out Veterans Administration Form 1900. After the application has been reviewed and approved, the veteran is asked to indicate whether he is ready to go through the screening process immediately or whether he prefers to defer action to some later date. Under the Law he may apply at any time within two years after the date of his discharge or two years after the termination of the war, whichever is the later. If the veteran elects immediate screening an appointment is made for him at the screening center.

A discharged veteran with no service-incurred disability who wishes to apply for training or for the continuation of his education under

Public Law 346 makes application to the Regional Office of Veterans Administration on Form 1950. It is possible, however, for a veteran in this case to apply directly to an educational institution. In the event that his application for admission to the institution is accepted he must then send a photostatic copy of his discharge papers and the acceptance by the particular institution to the Regional Office of Veterans Administration for approval. If the veteran is eligible, the institution approved and the project reasonable, the Veterans Administration merely gives formal approval and undertakes to pay for the course. A discharged veteran in this class may avail himself of the services of a screening unit to help him determine on an educational or occupational goal merely by appearing at the screening center with his certificate of eligibility for training. At such time he is placed upon a schedule in exactly the same manner as the disabled veteran and a description of subsequent steps applies equally well to either.

Steps in screening process. At the first interview in the screening process all necessary information concerning the veteran's family status, his educational background, his occupational background, his hobbies and interests, and any other pertinent factual material which will enable a vocational appraiser to aid the veteran in deciding upon an objective is elicited by an interviewer who records the data on Form 1902. When the point in the interview is reached at which a decision must be made as to whether or not intelligence tests, aptitude tests or questionnaires of various types should be used to help decide upon an objective, the interviewer refers the veteran to the vocational appraiser. The vocational appraiser reviews the data recorded on Form 1902 and if he feels that test results are needed, selects the specific tests to be given. At the same time he determines whether or not the veteran is legally entitled to training under Public Law 16. In other words, he establishes the "need" for training which requires the filling out of Form 1902a. Need for training cannot be established if the veteran is employed in a type of work that does not aggravate his service-incurred disability unless the veteran is working at an occupational level not commensurate with his ability. If there is no need for vocational training, the veteran is immediately referred back to the Veterans Administration's Vocational Advisor. When the veteran is not interested in training at the time, or vocational training is considered medically infeasible, a similar procedure is followed. If the Veterans Administration's Vocational Advisor agrees with the finding of "no need" he explains the situation to the veteran, explains the veteran's rights under the Law and makes such additional efforts in the veteran's behalf as attempting to obtain additional medical aid, appropriate employment, or such other action as the particular situation requires.

When "need" is established and particular tests have been decided upon, an appointment is made in the Test Section. There a psychometrist, familiar with the administration of all of the tests available in the screening center, gives the test to the veteran and arranges to have the test scored. When the test score is ready, the veteran is returned to the vocational appraiser. At this time the test results are discussed with the veteran and occupational possibilities are considered. Information about vocations is supplied and training facilities are discussed. The veteran is informed about training allotments, the length of the training period, the type of training, etc.

When the veteran and the appraiser agree on a particular job objective Form 1902b is executed by the vocational appraiser and the veteran is referred back to the Veterans Administration's Vocational Advisor who reviews the recommendation. This Form 1902b contains a step by step record of the reasoning processes which enter into the choice of the occupational objective. If this advisor agrees with the recommendation of the appraiser, the veteran is then turned over to Veterans Administration's Training Officer with whom the details of selecting a training institution, signing the contract, etc. are worked out. If the veteran is undertaking the training under the provisions of Public Law 16 this training officer is also responsible for following the veteran's progress throughout the training period, but if the training is undertaken under the provisions of Public Law 346 no such check-up is required. In either case, however, a report from the institution at which the training is given that the veteran is not pursuing the training successfully will cause the Veterans Aministration officials to terminate the training.

Personnel. In carrying out the various steps of the procedure described above personnel of two professional levels have been used in addition to the clerical staff. Those who collect background information (age, education, work experience, interests, etc.) are of the graduate student level. They have obtained their Masters degrees in Psychology or Education and have had considerable experience as interviewers. While intelligent interviewers with less formal education can, if properly trained, do an effective job in conducting this initial interview, it must be clearly understood that it is not simply a routine clerical task. The mental set of the veteran toward the whole screening process can very easily be affected in this initial step and individuals with superior ability should be preferred. Persons at this level also administer the individual and group tests and questionnaires assigned to the veterans. At our own Center at the start of the program, the same four individuals were responsible for both interviewing and testing. Experience has indicated, however, that it is advisable to have a separate group for each of these tasks.

The work of appraising the occupational possibilities of the veteran, assigning tests to be administered, interpreting test results, giving counsel to the veteran, determining the need for vocational training, and setting the final job objective is done by experienced psychologists who possess the Doctorate and have had at least five years of experience in advisement. The veterans encountered in the program to date range from 17 years to 50 years in age. Their educational backgrounds vary from a few years of primary school to several years of post graduate work. The degree of service-incurred disability ranges, on the physical side, from severe cases of pes-planus to the loss of both arms, hearing, and the sight of one eye, on the part of one man, and in the mental realm, from minor neurotic disturbances to moderately severe psychotic disorders. The range in their social levels, cultural levels and previous occupational experience is in each case almost as wide. Under these circumstances it is obvious that even the best possible preparation can be all too meager for the undertaking of advisement. It is our belief that entrusting the work of actual advisement to those with more limited educational and experience backgrounds may accomplish much more than merely provide the veteran with inadequate and inept guidance. It may be dangerous from the point of view of the veteran himself, it may jeopardize the success of the Veterans Administration Project, and reflect discredit upon the whole guidance movement. Extreme care in preparing forms which have all of the appearance of accurate instruments for guidance procedures cannot possibly make up for a deficiency of sound judgment, adequate preparation and extensive guidance experience. At the City College Unit four senior appraisers devoted their entire time to this part of the work.

Tests. The Veterans Administration has as yet published no official list of tests which should be available at any center. For that reason, reasonably well-known commercial tests were selected. The limitations of many of the tests included in the list are clearly realized and failure to include numerous other very satisfactory tests is also recognized. It was necessary, however, to set up quickly a supply of tests readily procurable which would meet our anticipated needs. The norms used in each case are either those supplied by the publisher of the test or those found in the literature. It is expected that local norms will be prepared as soon as the number of cases tested is sufficiently large to permit it. In assigning tests to any particular veteran, selection is made with his own background and interests in mind. No attempt has been made to establish test batteries according to types. The wide variation in background, interests and abilities encountered in those veterans who have appeared thus far precludes the possibility of setting up any such batteries. The following tests are available for use at this Center:

ACE Psychological Examination (Thurstone)
Army Alpha, Modified Form 9
Revised Beta Examination (Kellogg & Morton)
Bell Adjustment Inventory
Bellevue-Wechsler Intelligence Scale
Bennett, Test of Mechanical Comprehension
Bernreuter, Personality Inventory
*Carnegie Pre-Engineering Inventory
  Test 1—General Verbal Ability
  Test 2—Technical Verbal Ability
  Test 3—Ability to Comprehend Scientific Material
  Test 4—Ability to Do Quantitative Thinking
  Test 5—Ability to Comprehend Mechanical Principles
  Test 6—Spatial Visualizing Ability
Color Blindness Test (American Optical Co.)
Cooperative English Test—Form R
Cornell Selective Index
Cooperative General Achievement
  Test I: Social Studies
  Test II: Natural Science
  Test III: Mathematics
Cooperative French Test (Advanced Form Q)
Cooperative German Test (Advanced Form Q)
Cooperative Italian Test (Experimental Form Q)
Cooperative Spanish Test (Advanced Form Q)
Iowa Silent Reading Test—Advanced Test—Form AM
Kuder Preference Record—Form BB
MacQuarrie Test for Mechanical Comprehension
McAdory Art Test
Meier Art Judgment (Revised)
Revised Minnesota Paper Form Board
Minnesota Rate of Manipulation Test
Minnesota Reading Examination for College Students
Minnesota Spatial Relations Test
Minnesota Test for Clerical Workers
Ohio State University Psychological Test—Form 21
Otis Quick Scoring Mental Ability Test (Alpha, Beta, Gamma)
Personnel Test (Wonderlic)
Porteus Maze, Vineland Revision
Psycho-Somatic Inventory (MacFarland & Seitz)
Purdue Peg Board
Rorschach Psychodiagnostik
Seashore Measures of Music Talents
Sones-Harry High School Achievement
Stanford-Binet Tests of Intelligence (Revised)
Stanford Scientific Aptitude Test (Zyve)
Stanford Achievement Tests (Primary, Intermediate and Advanced Batteries)
Strong Vocational Interest Blank
Thurstone, Examination for Clerical Work
Whipple, High School and College Reading Test

Reference materials. In the course of the interviewing and advisement procedure the reference materials listed below are regularly used by staff members. The sources from which they have been obtained are also indicated.

Veterans Administration's Manual for Vocational Advisement. (Veterans Administration)
Copies of Public Laws 16 and 346. (U. S. Gov. Printing Office)
Medical Dictionary.
Dictionary of Occupational Titles: Parts I, II, IV and Supplement. (War Manpower Commission)
Job Family Series. (War Manpower Commission)
Job Descriptions. (U. S. Employment Service)

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* By special arrangement made with Dr. Kenneth Vaughn

Interviewing Aids. (War Manpower Commission)
Special Aids for Placing Navy Personnel in Civilian Jobs. (War Manpower Commission)
Special Aids for Placing Army Personnel in Civilian Jobs. (War Manpower Commission)
Army's Occupational Dictionary. (War Department, A.R. 615-26)
Army's Technical Manual dealing with Interpretation of Army Test Scores (Technical Manual, Personnel Classification Tests, War Department, TM 12-260)
Operations Manual for Placement of the Physically Handicapped. (U. S. Civil Service Commission)
Directory of Opportunities for Vocational Training in New York City. (Vocational Service for Juniors, New York City)
Catalogs from various schools. (Especially local schools and colleges)
General books and articles on tests, relationship between occupations and handicaps, etc.

Local experience. During the first three months (from June 26th to September 25th) 487 cases were sent to the Screening Unit at the College and 431 of these were completed. The remaining 56 cases were in various stages of processing at the end of the period. Some of these remaining cases had evidently abandoned the idea of going through the screening procedure for several weeks had elapsed since their last appearance at the Center though attempts had been made to have them return. The time necessary to complete a case varies greatly. A few are completed within one day. A few, for whom credentials or other data must be obtained, take as much as three weeks though they do not appear at the Center each day during this time. For the average case three full days are needed. No attempt to complete a case within one day is made since screening is done much more efficiently if background data are collected and decision on tests to be given is made on the first day. On the second day tests are administered and corrected. On the third day the test results are discussed and a job objective arrived at. A tabulation of the first 185 cases referred to the Center, shows an average of two tests or questionnaires given in each case with a range from none to seven tests. In 73% of the cases training was recommended. Another 17% was not recommended for training because the individuals were found not to need training, were not interested in training at the moment, or seemed to need medical care before entering the training program. In the remaining 10%, the counseling process had not been completed.

The attitude of the veteran as to whether or not the advisement procedure through which he has passed has been of value to him may have the effect of inducing other veterans to make use of the advisement procedure or to avoid it and in this way affect the program to a certain extent. Its ultimate success or failure, however, must be dependent upon the long range results of the advisement and several years may elapse before final evaluation can be made. While waiting for this verdict, those engaged in this work must make every effort to perfect procedures and to use personnel in the guidance program who can give to the veteran, psychological and vocational guidance of the highest calibre.

BOOK REVIEWS

BARKER, R. G., KOUNIN, J. S. & WRIGHT, H. F. (Eds.) *Child behavior and Development.* New York: McGraw-Hill, 1943. Pp. viii+652.

The 35 studies contained in this volume were selected partly upon the recommendation of members of the Society for Research in Child Development and partly through the exercise of the editors' judgment. Each of the 110 members of the Society was asked to list the six studies of child behavior and development which it would be most desirable to include in a book of basic reading material for college students. The editors hoped that such a volume might find use as central rather than collateral reading in child psychology courses. For any one area of child psychology they used the studies most frequently nominated by the 52 respondents. Editorial judgment was used mainly to give representation to areas which in the editors' estimation had been neglected by the respondents. Most of the studies were performed during the past 10 years and almost all of them within the past 15 years.

Each research is reported by the original investigator in the manner usually followed in scientific journals. Though the original book or monograph is necessarily abbreviated, each study is presented in sufficient detail so that the reader can evaluate the soundness of the conclusions for himself. Almost throughout the book volume, the reader can feel that he is actually participating in the research process.

After an initial chapter on the history and future of research in child psychology (Frank), there follow studies of the foetus (Hooker), the neonate (Irwin), and of conditioning (Wenger) and prehension (Halverson) in infants. These are followed by studies of language development (McCarthy), intellectual growth (Bayley, Deutsche, F. M. Freeman, Flory, and Kounin), and of the Stanford-Binet scales for measuring intelligence (Terman and Merrill). Gesell and Thompson describe their classic experiments on learning and maturation in identical infant twins, Olson and Hughes present statistical summaries of important aspects of child growth, and Terman shows the mental and physical traits of a thousand gifted children. Three researches are devoted to the effects of pre-schools (Wellman), foster-families (Burks), and foster homes (Skodak) on intellectual growth as determined by intelligence tests. Macfarlane presents a study of some of the environmental factors influencing personality development and Jersild reproduces his investigations of children's fears.

Most of the last 15 researches are in social settings and should be of as much interest to the social as to the child psychologist. Many of these researches represent systematic observations in complex situations, either actually in real life or closely approximating real life. The wide range covered by these studies can perhaps best be indicated by listing their contents. Lois Murphy writes on the manifestations of sympathy in the nursery school child, Escalona on play and substitute satisfactions, Wright on the effects of barriers on the strength of motivation, Levy on sibling rivalry, Erikson on clinical studies in childhood play, Keister on the behavior of young children in failure, Barker, Dembo, and Lewin on frustration and regression, Harold Anderson on domination and socially integrative behavior, Lippitt and White on democratic, authoritarian, and laissez-faire children's groups, Parten and Newhall on the social behavior of pre-school children, Jennings on personal attractions and repulsions as measured by sociometric techniques, Caroline Tryon on the evaluation of adolescent peronalities by adolescents themselves, Sanford on personality patterns in school children, Harold Jones on the development of a specific adolescent, Davis on child training in different Negro social classes, and Dennis on the Hopi child.

Taking the book as a whole, the reader cannot fail to be impressed by the variety and high scientific quality of the methods devised by child psychologists, by the number of significant and complex aspects of child behavior illuminated by those methods, and by the practical usefulness of many of the conclusions reached. Child psychology has marched ahead vigorously and explored many new regions during the decade and a half in which most of these researches were conducted. Gone are the days when the scientist timidly investigated the simplified reactions of a child to an isolated stimulus. Most of the researches in this book are devoted to the study of the reactions of the whole child to whole situations.

There may be disappointment, however, at the paucity of basic principles and hypotheses valuable in understanding and predicting child behavior. Systematic and comprehensive investigations of the role played in child development by the conditioned response and other principles of learning, for instance, are conspicuous chiefly by their absence. Little attention is paid to the general circumstances under which child learning occurs and to the principles, other than maturation, determining the transformation of the predominantly diffuse behavior of the infant into the specific behavior patterns of the older child. (An exception to this statement is Davis' study of child training in various Negro classes; one senses a consistent theory of learning behind this study.) Research in child psychology seems to be mainly a matter of sinking exploratory shafts more or less indiscriminately here and there into child nature as new techniques come to hand, or of developing procedures and conclusions of immediate practical usefulness in current situations.

It is possible that the editors' aim of creating in college students an appreciation and understanding of the research process might more effectively be attained by a description of the methods used in modern child psychology, followed by a few well chosen researches to illustrate those mtehods. Does the college student have either the time or the inclination to examine the scientific basis for *each one* of the studies in child psychology whose results might contribute significantly to his education? The detailed and occasionally repetitious description of techniques has compelled the omission, as the editors themselves admit, of investigations "many of them certainly equal in merit and significance to those in the final selection." For these reasons, the reviewer is inclined to feel that though this book contains significant researches of high scientific caliber, it is more likely to find its place as an excellent, convenient, and much needed reference book in child psychology, than as a well unified and adequately inclusive basic text.

CLARENCE LEUBA.

Antioch College.

KASANIN, J. S. (Ed.). *Language and thought in schizophrenia.* Collected papers, with a preface by Nolan D. C. Lewis. Berkeley and Los Angeles: Univ. Calif. Press, 1944. Pp. xiv+133.

This book contains eleven papers by nine different authors. The editor, Dr. J. S. Kasanin, of the University of California Medical School, is best known as co-author with Dr. Eugenia Hanfmann of the monograph "Conceptual Thinking in Schizophrenia." He has been influenced particularly by the Russian investigators, Luria and Vigotsky. With the exception of S. J. Beck, Ph.D., all the authors represented in the book are medical men.

It is to be realized, of course, that a slender volume of this sort has certain limitations, since it is made up of short papers by several different writers, each concerned with a particular aspect of, or approach to, a complex problem. For this reason, it is necessarily somewhat sketchy, limited in scope and more or less loosely organized. In order to evaluate it adequately, one needs a considerable fund of information beyond that which it contains, because none of the authors supports or qualifies his position with very much detail. The data presented are for the most part illustrative and suggestive rather than rigorous and comprehensive. Moreover, certain noteworthy approaches to the problem treated are not considered. Among these are the statistical methods of language analysis represented by the work of Zipf, Skinner, Carroll, and others; procedures involving intelligence tests, certain language tests and a number of projective techniques; and the systematic approach to language behavior study provided by general semantics. Another book as large or larger, and doubtless as significant, as this one could be made up of papers dealing with approaches not covered in this one. Whether or not these statements are to be construed as criticism is beside the point; they are offered simply as statements of the book's obvious limitations—limitations of which the editor is undoubtedly aware, and of which the reader should be clearly cognizant.

With these limitations recognized and granted, it is to be said with considerable emphasis that this little book fills an important need. It provides a stimulating introduction to a problem of great significance not only to psychiatrists but also to psychologists and to all other students of language behavior.

In the preface Nolan D. C. Lewis gives a concise summary of the language aspects of schizophrenia as he sees them, pointing out the influence of the structure of one's acquired language upon one's modes of thought, and emphasizing that language is to be interpreted as a function of the situation in which it occurs. Harry Stack Sullivan presents some incisive observations concerning language as a cultural phenomenon.

Kurt Goldstein compares the responses of schizophrenics and of patients with cortical lesions to his well-known sorting tests. He contends that schizophrenics are deficient in so-called abstract thinking; their language is unduly restricted in meaning to its specific situational context. Kasanin discusses the failure of generalization in schizophrenic thinking as indicated by the Vigotsky test, which requires classification of blocks of different sizes, shapes and colors. On the basis of tests in which the subject is required to verbalize causal relationships, Norman Cameron distinguishes eight features of schizophrenic thinking. John D. Benjamin presents some intriguing data obtained by asking patients to interpret proverbs, data which indicate a striking literalness in the schizophrenics' interpretations.

S. J. Beck reports illustrative Rorschach data obtained from schizophrenic patients, and contends that such patients do not have rich fantasy lives—the simply make perceptual and judgmental errors. E. Von Domarus discusses the logical forms of schizophrenic thought.

In this reviewer's opinion, the most provocative paper is that of Andras Angyal, who emphasizes the schizophrenic's tendency to identify or confuse the realms of imagination and reality, to drift freely "from one semantic stratum into another." He calls particular attention to the schizophrenic's inability to deal with systems or patterns of relationships.

In a concluding chapter Kasanin summarizes the papers of the various contributors. He says, "We all agree that the most important cause of disturbances in the thought and language of schizophrenia is the disarticulation of the patient from his social context."

It is not to be missed that none of the writers rigorously differentiates "thought" from "language." In spite of this and the other limitations mentioned, the book should prove of considerable value in stimulating the refinement of theoretical formulations and investigative procedures.

WENDELL JOHNSON.

State University of Iowa.

SALTER, ANDREW. *What is hypnosis?* New York: Richard R. Smith, 1944. Pp. vi+88.

This slender volume of less than one hundred pages is obviously popular in tone despite the author's attempt to convey authority by copious reference to the work of other psychologists. As he states in his preface, "They will be bewildered to see their work considered here with mine."

In the first two chapters Salter establishes his hypothesis that hypnosis is a special instance of verbal conditioning. He concludes, "Hypnosis now remains merely a term of convenience. It is all conditioning, and when this is constantly kept in mind hypnosis, or conditioning, becomes an instrument of the most fantastic power, and the person under treatment needs neither faith, nor hope, nor confidence for satisfactory psychotherapy." The next two chapters relate some loosely connected but interesting phenomena observed in the author's "experiments." The final chapter is an appendix containing a reprint of an article on techniques of autohypnosis previously published in the *Journal of General Psychology.*

Salter's book raises a question; it does not answer it. It is unfortunate that Salter's treatment of his subject is not such as to lessen the ill repute in which hypnosis is currently held.

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NOTES AND NEWS

George Sidney Brett, dean, School of Graduate Studies, University of Toronto, died, Oct. 27, 1944, at the age of sixty-four years. Dr. Brett, a philosopher, specialized in the history of psychology, a field in which he wrote many books and articles.

Therman K. Sisk, dean and professor of psychology, State Teachers College (Livingston, Ala.) died recently at the age of sixty-six years.

Maurice J. Neuberg, director of personnel and professor of Education at Wittenberg College (Springfield, Ohio), died on Feb. 10, 1944.

E. Ruth Kellogg, school psychologist at the Illinois School for the Deaf (Jacksonville, Ill.) died on Feb. 17, 1944.

The death is announced of **I. Huang**, professor of psychology at the National University of Chekiang, Tsunyi, Kweichow, China.

Caroline Taylor has been appointed to the faculty of the department of psychology, Newcomb College, Tulane University.

Claude M. Dillinger, formerly associate professor of psychology, Southwest Missouri State Teachers College (Springfield) has been appointed to the faculty at Illinois State Normal University (Normal, Ill.).

Pi Lambda Theta, the National Education Association for Women, announces two awards from the Ella Victoria Dobbs Fellowship Fund, of $400 each to be granted on or before August 15, 1945, for research on the "Professional Problems for Women." Three copies of the complete research report are to be submitted to the Committee on Study and Awards by July 1, 1945. Information concerning the awards and the form of the final report may be obtained from **May Seagoe** of the Committee on Studies and Awards of the University of California at Los Angeles, California.

The appointment of a civilian Board of Consultants to act in an advisory capacity to the Army's recently created Correction Division for military prisoners, has been announced by the War Department. The Board is composed of recognized authorities in the field of penology. Also serving on it is **Austin H. MacCormick**, Consultant to the Under Secretary of War in matters relating to military penology. Directed by Colonel Rushton, the Correction Division of the Office of The Adjutant General has staff supervision over the Army's six rehabilitation centers and five disciplinary barracks, as well as installations for the detention and rehabilitation of general and garrison prisoners in overseas theaters of operation. The mission of the rehabilitation and detention centers is to restore to honorable status in the Army those prisoners who demonstrate their fitness for further service, and to provide those to be discharged because of their unfitness a program of training which will help them to meet more successfully the duties and obligations of citizenship.

INDEX OF SUBJECTS

Age-placement of Binet tests, 41
American Psychological Association
    by-laws, note, 230
    Joint Constitutional Committee, 235
    journals, articles for, 345
    notice, 52nd Annual Meeting, 384
    proceedings, 52nd Annual Meeting, 725
    program, 52nd Annual Meeting, 413
    Rocky Mountain Branch, Proceedings, 794.
Army Air Forces
    aviation cadet qualifying examination, 385
    clinical psychologist mental hygiene unit, 543
    clinical research aviation program, 551
    convalescent-rehabilitation program, 548
    history, organization and activities, psychological test film unit, 457
    history, organization and procedures, PRU #1, 103
    organization and research activities, PRU #3, 237
    placement testing civilian personnel, 167
    research program psychomotor tests, PRU #2, 307
Army experiment retraining psychoneurotic casualties, 519
Army specialized training program, psychological consultation in a STAR unit, 395
Army training center, personnel consultant in, 180
Articles, preparation of, for APA journals, 345
Analysis of variance
    in psychological research, 158
    interpreted as intercorrelation, 287
Attitudes of psychology majors, 433
Aviation cadets
    Army—see Army Air Forces
    Navy, 57

Bibliographies in child development, 615
Binet tests, age-placement of, 41
Blinker adaptation of Thurstone's 1943 Code, Aptitude Test, 322
By-Laws of the APA, note on proposed, 230

Casualties, retraining psychoneurotic, 519
Central examination board for the training of Naval air cadets, 57
Chart of the proposed APA reorganization, 43
Child development, bibliographies in, 615
Civilian personnel in the air service command, placement testing of, 167
Clinical psychologist
    in aviation program, 551
    in an AAF mental hygiene unit, 543
    in Army hospitals, 510
    in military services, 502
    in a Naval hospital, 561
    clinical psychology, testing needs in military, 539
Coast Guard Academy, psychological activities of the U. S., 568
Code aptitude test, Blinker adaptation of Thurstone's, 322
Cuba, psychology in, 73

Discharged service personnel, psychological adjustment of, 689

Eastern Psychological Association, Proceedings 15th Annual Meeting, 580
Educational acceleration and post-war scientific leadership, 681
Electrical shock, psychological disorders resulting from, 377
Electroencephalography, 416
Environment, potentiality and, 1
Expanding opportunities for women psychologists in the post-war period, 706

Factors related to vocational interests, 137
Freedom and constraint or potentiality and environment, 1

General mental ability, new Army individual test of, 532
German industrial psychology in the fifth year of war, 605

History, organization and procedures, PRU #1, AAF, 103
History, organization and research activities, psychological test film unit, AAF, 457
Hospital, psychologist in Naval, 557, 561
Hospitals, clinical psychology in Army, 510
Hospitals, reconditioning program in Army, 515
Hull's principles of behavior, 269
Hull's "treatment of learning," 640

Industrial psychology, German, 605
Interaction in analysis of variance interpreted as intercorrelation, 287

Joint Constitutional Committee of the APA and AAAP, 235

Learning, Hull's treatment of, 640
Libraries, psychological journals in foreign, 455

Maritime service, psychological work in, 664
Mechanism of monocular accommodation in man, 634
Menstrual cycle on women workers, psychological effects of, 90
Mobilization of psychologists for war services, 469
Modern account of problem solving, 201
Monocular accommodation, 634

Naval hospital
    clinical psychologist in, 561
    psychologist in, 565
Naval reserve, 400 psychologists in the, 253
Naval training stations, psychologists in, 557
New Army individual test of general mental ability, 532
Notes
    on the age-placement of Binet tests, 41
    on the meeting of the Joint Constitutional Committee of the APA and AAAP, 235
    on the proposed By-Laws of the APA, 230
    psychological journals for foreign libraries, 455
    psychology and the war, 258, 669
    psychology in occupied Shanghai, 304
    shall affiliated organizations have direct representation on the proposed council of representatives? 300

Occupational and vocational counseling of military and civilian personnel during the period of post-war demobilization, 697
Occupational and vocational rehabilitation, 47
Office of Psychological Personnel, report for 1943, 246
Organization and research activities, PRU #3, AAF, 237

Personal data and achievement in a radio training school, 60
Personnel consultant
    in an Army training center, 180
    in an Army rehabilitation center, 524
Personnel-psychologists at Stanford University, 474
Placement testing of the civilian personnel in the air service command, 167
Post-college vocational activities and attitudes of psychology majors, 433
Post-war reemployment prospects in psychology, 653
Potentiality and environment, 1
Preparation of articles for publication in APA journals, 345
Principles of behavior, Hull's, 269, 640
Problem solving, a modern account of, 201
Proceedings
    15th Annual Meeting Eastern Psychological Association, 580
    52nd Annual Meeting APA, 725
    24th Annual Meeting Western Psychological Association, 586
    Rocky Mountain Branch APA, 794
Program, 52nd Annual Meeting APA, 413
Psychological
    activities U. S. Coast Guard Academy, 568
    adjustments discharged service personnel, 689
    consultation service in the ASTP STAR unit, 395
    disorders resulting from electrical shock, 377
    effects of the menstrual cycle on women workers, 90
    journals for foreign libraries, 455
    personnel, 1943 report of office of psychological, 246
    research, AAF—See Army Air Forces
    work U. S. Maritime Service, 664
Psychologist
    clinical in Naval hospital, 561
    in Naval hospital, 565
    in psychiatric program Naval training stations, 557
Psychologists
    personnel at Stanford, 474
    commissioned in Naval Reserve, study of 400, 253
    mobilization of, for war services, 469
Psychology
    clinical, testing needs in military, 539
    clinical, in Army hospitals, 510
    clinical, in military services, 502
    in Cuba, 73
    in occupied Shanghai, 304
    majors, vocational activities and attitudes, 433
    post-war reemployment prospects, 653
    some unfinished business, 713
    women in American, 447
Psychology and the War, 47, 103, 167, 237, 307, 385, 457, 502, 653, 795
Psychology and the War, notes, 258, 669
Psychoneurotic casualties, retraining, 519
Publication in APA journals, preparation of articles for, 345

Radio training, relation of personal data to achievement, 60
Reconditioning program, Army general hospitals, 515
Reemployment, post-war prospects, 653

Rehabilitation
  occupational and vocational, 47
  personal consultant in an Army center, 524
  program, AAF convalescent, 548
Relation of personal data to achievement in a radio training school, 60
Research
  analysis of variance in psychological, 158, 287
  AAF—See Army Air Forces
Retraining psychoneurotic casualties, 519
Rocky Mountain Branch APA, Proceedings, 794

Schilder's mind: perception and thought and goals and desires of man, 30
Scientific leadership, education acceleration and, 681
Shall affiliated organizations have direct representation? 300
Shanghai, psychology in occupied, 304
Shock, disorders from electrical, 377
Social psychologists in the national war agencies, 115
Some testing needs in military clinical psychology, 539
Special training center, work of psychologists in Ninth Service Command, 187
STAR Unit and consultation service in ASTP, 395
Study of 400 psychologists commissioned in the U. S. Naval Reserve 253
Symposium: psychology and post-war problems, 681

Thurstone's code aptitude test, Blinker adaptation of, 322

Variance, analysis of
  in psychological research, 158
  interaction as intercorrelation, 287
Veterans administration vocational training program: processing procedures used by CCNY, 795
Vocational
  activities, post-college of psychlogy majors, 433
  counseling, occupational and, 697
  interests, factors related to, 137
  rehabilitation, occupational and, 47
  training program, Veterans administration, 795

War agencies, social psychologists in national, 115
War services, mobilization of psychologists for, 469
Western Psychological Association, Proceedings, 24th Annual Meeting, 586
Women in American psychology, 447
Women psychologists, Expanding opportunities for, 000
Women workers, psychological effects of menstrual cycle, 90
Work of psychologists in the 9th service command special training center, 187

INDEX OF AUTHORS

ORIGINAL CONTRIBUTIONS, SHORT ARTICLES, SPECIAL REVIEWS, REPORTS, NOTES

Abel, T. M., 580
Altus, W. D., 187
Anderson, E. E., 230
Anderson, J. E., 1, 43, 235, 345
Ansbacher, H. L., 605

Bedell, R. C, 57
Bell, H. M., 187
Berdie, R. F., 137
Bobbit, J. M., 568
Boring, E. G., 447
Brophy, D. F., 795
Bryan, A. I, 447

Carlson, H. B., 322, 433

Deutscher, M., 543

Elliott, R. M., 47

Fischer, R. P., 30

Gilbert, G. M., 180
Gilman, R., 416
Gilman, R. D., 548
Goodenough, F. L., 615, 706
Grant, D. A., 158
Gundlach, R. H., 586, 634

Hadley, J. M., 60
Henderson, R. W., 395
Hunt, W. A., 557

Jaspen, N., 41
Johnson, D. M., 201

Koch, S., 269

Layman, J. W., 515
Lennon, R. T., 167
Limburg, C. C., 664
Lipkin, S., 524
Long, L., 795
Louttit, C. M., 253

Marquis, D. G., 115, 246, 469, 653
Mitchell, M. B., 561

Newman, S. H., 568

Olson, W. C., 725

Peatman, J. G., 300
Peters, C. C., 287
Portenier, L. G., 794
Pressey, S. L., 681

Ramsey, G. V., 548
Remmers, H. H., 713
Rich, J., 322
Richards, T. W., 565
Ritchie, B. F., 640
Rogers, C. R., 689

Sears, R. R., 502
Seidenfeld, M. A., 510
Seward, G. H., 90
Shartle, C. L., 697
Spencer, B. L., 377
Strong, E. K., Jr., 474
Super, D. E., 551

Valentine, W. L., 43, 345, 455
Vernon, W. H. D., 73

Wallen, R., 539
Watson, S. M., 433
Weitzman, E., 57
Westbrook, C. H., 304

BOOKS REVIEWED

Ackerson, L., 595

Barker, R. G., 803
Bills, A. G., 336
Bockner, R., 64
Bolles, M., 194
Bowley, A. H., 601
Breckenridge, M. E., 338
Burtt, H. E., 405

Case, H. W., 128
Child, I. L., 262

Davidson, H. H., 671
Doherty, W. B., 127

Fernald, G. M., 340
Fry, C. C., 68

Gage, N. L., 132
Gasser, H. S., 491
Gellhorn, E., 130
Glueck, E., 596
Glueck, S., 596

Hall, V. E., 494
Helpern, F., 64
Hinsey, J. C., 491
Hough, R. B., 128

Jacobi, J., 496
Jennings, H. H., 263
Jones, H. E., 334

Kasanin, J. S., 804
Kluver, H., 492
Kounin, J. S., 803

Landis, C., 194
Langer, W. C., 66
Levy, D. M., 406
Luck, J. M., 494

Masserman, J. H., 332
McKay, H. D., 69
McMurry, R. N., 673
Meier, N. C., 261
Moore, H., 599
Morgan, C. T., 670

Newcomb, T. M., 131

Pennington, L. A., 128
Polyak, S. L., 192

Rapaport, D., 65
Reckless, W. C., 598
Remmers, H. H., 132
Roberts, W. H., 495
Rostow, E. G., 68
Runes, D. D., 127

Sachs, H., 197
Salter, A., 806
Sargent, H. S., 675
Shaw, C. C., 69
Stern, E. M., 133

Thorndike, E. L., 400
Tomkins, S. S., 339

Various, 676
Varnum, W. C., 71
Vincent, E. L., 338

Walls, G. L., 403
Whitney, D. D., 337
Wolff, H. G., 491
Wolff, W., 265
Wright, H. F., 803

Yerkes, R. M., 593
Young, P. T., 401

Zilboorg, G., 134

BOOK REVIEWERS

Arnold, M. B., 65

Bayley, N., 338
Brown, R. R., 64
Burton, A., 405, 673
Buxton, C. E., 336

Carmichael, L., 596
Carter, H. D., 337, 671
Challman, R. C., 66

Darrow, C. W., 130
Dimmick, F. L., 192, 492
Dudycha, G. J., 71

English, H. B., 128

Farnsworth, P. R., 261

Goodenough, F. L., 265
Grant, D. A., 598
Guthrie, E. R., 332

Harlow, H. F., 339
Harris, D. B., 69, 495, 595
Hunt, W. A., 806

Johnson, W., 804
Kantor, J. R., 400
Kellogg, W. N., 593
Kerr, W. A., 599

Lanier, L. H., 491
Leuba, C., 131, 263, 803

Martin, M. F., 601
Marzolf, S. S., 133
Maurer, K. M., 194, 340
Morgan, C. T., 494
Morgan, J. J. B., 406

Peters, H. N., 401

Seward, G. H., 676
Shor, J., 197, 496
Siple, H. L., 132
Spoerl, D. T., 262
Stone, C. P., 127
Sumner, F. C., 134

Waters, R. H., 675
Wilkening, H. E., 68
Wolfle, J. B., 334

Zigler, M. J., 403, 670

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